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Stage II

January
1989

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ON THE COVER: Spectator scene and ASA Trophy girl at the Indiana Asphalt Champs (photos by Steve Sellers). Center: MRP High Roller (photo by Dave McNattin) and the Parma Pro 10 (photo by Rich Hemstreet). Top right: 2WD contender flying at the RCCA/Trinity Shoot-out, at Quincy, IL (photo by Steve Pond) and MRP Stage II (photo by Joe Bruni). Bottom right: Parma Sprint Car (photo by Von Erich).

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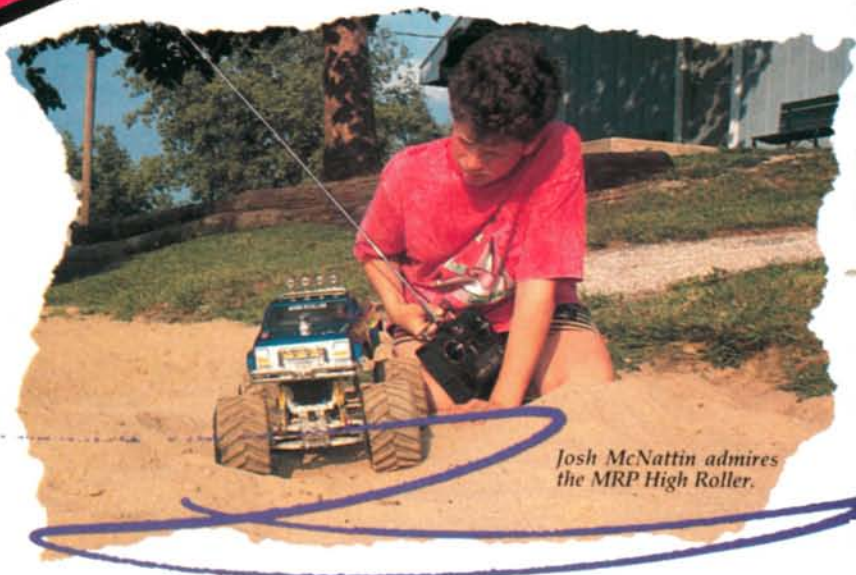
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EDITORIAL

by CHRIS CHIANELLI



Josh McNattin admires the MRP High Roller.

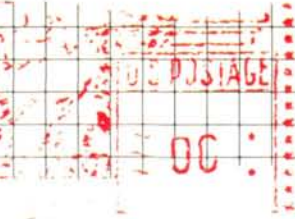
THIS ISSUE MARKS the third anniversary of *RCCA*'s birth. The R/C car industry has grown at an unbelievable rate and in so many directions, and so have we. Being part of this growth, the changes, and the success of *RCCA* has been a very rewarding experience. Be assured of one thing: We are acutely aware that our success is tied very closely to *you*. I know this might sound hokey, but it's *your* magazine. *RCCA* is here *for* you, and *because of* you. If there's anything that annoys or discourages you—especially if you think it's unfair—write to us; we want to know and to keep in touch with our readers. That's the way it's been, and that's the way we're going to keep it, so please take advantage.

In this issue, Dave "Rocket Man" McNattin takes a look at the MRP High Roller, Rich Hemstreet reviews the Parma 1/10-scale on-road Pro Panther 10 and, since we got such a positive response to the R/C fast-boat article in the September issue, we've stuck in another one. Mike Lee runs the brand-new Graupner Cobra with all the electrics from one of his 1/10-scale electric cars.

The next issue is our second annual stock-car blitz, complete with on-road info and stock-car finishing tips, and, of course, a high-speed, high-bank oval report from the Car Action Weekend at Lake Whippoorwill International Speedway.

Message from the Ayatollah: For those about to R/C: We salute you! ■

Letters



WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, Illinois; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

ROAR Regs?

According to ROAR rules, can any kind of brushes be used in a stock motor, or just stock and timed? Can you use brushes you cut yourself? What about in the modified classes? I agree with Mr. Provetti that stock motors should be uniform, but only in wire size, turns on the armature and timing. Why shouldn't people who experiment with relatively inexpensive brushes and springs be rewarded with higher speeds? Experimenting is how they make real (maybe I should say full-scale!) race cars go faster, isn't it?

BILL SCHMITT
Horsham, PA

Bill, brushes and springs can be replaced on open end-bell stock motors in ROAR racing. ROAR rules already limit wire size and number of turns of wire in stock motors. The problem has been a lack of regulation concerning the timing built into stock motors. We're all for going faster, but the key to stock racing success is to keep the costs down.

RH

To Peak On Time or Not

Hi! I'm 14 years old, and I'm also hearing-impaired. I love your magazine! Sometimes I read it over again and again; I just can't stop! I like your work.

I have a peak charger that operates off a 12V car battery. Can I run the peak charger off a regular, timed charger instead of a car battery, and then use the peak charger to charge a battery pack, or will it burn up my peak charger

because of too many volts running into it?

Keep up your super work!

FRANK MOUNTS
Portland, OR

Frank, while I've heard of racers using AC chargers as power supplies for their DC peak chargers, it is not a recommended practice. Many DC peak chargers need a filtered power source to work properly. To do this, you need an AC/DC converter that provides filtered output. If you decide to try this on your own, I suggest you contact the manufacturer of each unit before you try it.

RH

Congratulations to Our First Winner!

Your magazine is great! It's the best on the market. I was just looking through your November issue, and have really enjoyed your RC10 Tech articles.



CHOOSE YOUR WEAPON

You've dared to take the R/C challenge. Your mission is clear: Load your hottest car with high-powered Pro-Line tires.

Hit the trigger.

Now hold tight and watch the

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strong and tough, for dead-on durability.

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They've all helped.

However, I did notice a small error in this issue. In your Budget Racer article (pg. 30), you have a picture of a car sliding sideways. You said this was an RC10. I looked closely and noticed this car is a Turbo Optima Mid SE. I know, big deal! Just goes to show you how much most of us enjoy your mag.

JOHN HINRICHS
Chino Valley, AZ

Thanks for the support. You, John, are the premier winner of the RCCA "Eagle Eye of the Month Award." Each month, an intentional, incorrect photo or word will appear in our mag. The writer of the eighth letter identifying the error will receive a gift. John will receive a color assortment of R/C Car Action decals. Nothing gets by you, John!

CC

Bumperless Champs?

I think your mag is the best in the world and so do my friends—we all buy it.

Do you think the bumper of the car affects the way it goes? Have you noticed that the last two world champion cars didn't have a bumper? Maybe it has something to do with the way it goes through the wind or something. Keep up the good work!

HERMAN HILL
Aiken, SC

Herman, while bumpers on off-road cars do offer some wind-resistance, I doubt that's why they aren't used. The top drivers are probably more concerned about losing a shot at the World title by getting their bumper locked to another car during the first-turn nerfing than the aerodynamic considerations of running a bumper. But from the average racer's

point of view, a bumper does protect your front suspension and should be used.

RH

R/C Success!

I'm not one to write letters, but you deserve to know what a great magazine you people have put together!

I just started in R/C cars last year, mostly building cars for the local kids and taking care of any problems they might have. Your magazine has helped me quite a bit in these areas. Your "Letters" and "Pit Tips" departments are worth the cost of the magazine alone!

I've been bitten by the R/C bug. I entered my completely stock RC10 in the Novice Class, coming in 2nd in the first two heats. Then, after adjusting my suspension as per your articles, I won



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WHY THE HQ 505?

The new ROBART HQ 505 Electronic Throttle has been designed to provide electric powered Radio Control enthusiasts the utmost in advanced electronic throttling for R/C cars, trucks, dragsters and R/C gliders using folding props.

The HQ 505 Electronic Throttle is an advanced proportional speed control with proportional brake and high speed and neutral adjustments. It is optically coupled for glitch-free radio operation, weighs less than 1.9 ounces, and has an efficiency rating of better than 98% which means it delivers more power to your motor.

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HQ 505 SPECIFICATIONS:

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Power Dissipation:	600-1000 watts
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Optically Coupled	
Adjustable Neutral, High Speed and Proportional Brake	

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Letters

the A-Main by $\frac{1}{3}$ of a lap. Thank you, *R/C Car Action!*

On my second trip to the track, I decided to race in the 2WD Stock Class. I had a 2nd and 3rd in the first two heats, which placed me in the 5th starting spot in the A-Main. At the drop of the flag, I pulled ahead of everyone and was in first place. I kept that spot until the $2\frac{1}{2}$ -minute mark of the race, when my right rear wheel fell off. (The first thing I did after the race was throw those nylon axle nuts away!) After a corner marshall found the nylon spinner, we put the car back on the track and I finished in 3rd place!—not too shabby for only my second race. I feel I wouldn't have gotten that far if it wasn't for your magazine.

Again, thank you very much for all your help, and you can expect to see a check in the mail for a year's subscription to your magazine very soon.

MIKE BELMONTE
Greenwich, CT

Mike, thank you. It's the loyalty of people like you that has made RCCA a success. It works both ways.

CC

Rocket-Car Safety

Here's a letter from Mary Roberts, Marketing Administrator at Estes, concerning some safety issues with rocket cars, like the one in the article "Final Countdown," which appeared in the July '88 issue of RCCA. As she points out, these engines were not intended for horizontal use, and we at R/C Car Action concur. But if you're still bent on building one, here are some safety tips.

CC

The article "Meet the Plasma Rocket Car" which appeared in the July 1988 edition of *Radio Control Car Action* was brought to my attention by one of our mutual consumers. The article outlines the use of Estes model rocket engines in R/C cars. The growing use of our engines in model cars, boats and other products, which are meant to move in a horizontal direction, gives me concern for the safety of the consumer. Some of the reasons are as follows:

1. The consumer should be a minimum of 15 feet from the engine during ignition, thrust, delay and ejection. This is in case of catastrophic failure.

2. The engine should be ignited electrically so that the user can be a safe distance away and have total control over ignition.

3. The launch vehicle should contain no structural metal parts, and should, in fact, be made of frangible materials such as paper, balsa wood and plastic.

4. R/C cars, boats, and other similar vehicles are not always designed to be aerodynamically stable, thus they may have an erratic travel direction.

5. *The launch area must be free of easy-to-burn materials.* When using model rocket engines in cars, the entire surrounding area must be free of flammable materials for distances up to 2,000 feet in any direction the vehicle may travel, to be free from burn or fire danger.

In addition to all the concerns listed above, it is our intent that the model rocket engines we manufacture be used in accordance with the Model Rocketry Safety Code, which states specifically that they will *never* be used to propel any device horizontally.

Based on the information I've outlined, I'm expressing our concerns to you and advising our mutual consumers *not* to use model rocket engines in the manner described in the July '88 article.

The Model Rocketry Safety Code has been developed and endorsed by the Hobby Industry of America (Model Rocket Division) and the National Association of Rocketry. By following the rules outlined in the Safety Code, model rocket enthusiasts have established a tremendous 30-year record of more than 300,000,000 safe, successful model rocket launches.

MARY ROBERTS
Marketing Administrator
Estes Industries

Racing Servicemen

I'm a U.S. serviceman who's due to return to the good ol' USA in December from my current assignment here in England. My next duty station is going

(Continued on page 14)

PUBLISHER'S PAGE

THIS ISSUE REPRESENTS a milestone for us, as we're ushering in our fourth year of publication of *Radio Control Car Action* magazine. I can vividly recall the excitement and enthusiasm we experienced with that first issue. Though, of course, so much smaller, it set the stage for our ultimate objective: providing the R/C car enthusiast with a colorful, informative medium to address his R/C car interests, and making the publication so dynamic that it would spark the interest of others outside the hobby as well. Well, three years later, the size of the magazine has more than quadrupled, and the growth of the industry is nothing short of unprecedented, thanks to you, the R/C car modeler. Radio control is here to stay!

I remember building a myriad of static plastic models back in the '60s: Mickey Thompson's first funny car, "The Little Red Wagon" wheelie pickup, Big Daddy Ed Roth's coffin dragster and many others. After all that time spent building and painting, I was left feeling frustrated, since the cars didn't move. Animation was needed, and, to accomplish this, we would sometimes end up burning the models and, believe me, I wasn't alone in these stunts. Movement was needed!

Enter radio-control cars. You build 'em and run 'em! It's that three-dimensional element of movement that sustains the young modeler. The variety of car types and where they can be run is incredible. The bulk of our hobby is made up of young teens who are usually active in 1/10-scale off-roading, but the road is widen-

ing every day. On-road, hot-rods, stock cars and the new 1/4-scale cars have attracted older people, including guys, like me, in their thirties who at one time worked on full-scale hot rods.

But what does all this accelerated growth mean, and where is the hobby really going? A clairvoyant I'm not, but I *am* a student of the obvious. Radio control is FUN and America is seizing the moment. America has always been in love with the car, and R/C is just another extension of this love affair. Stock cars, drag cars, monster trucks, Indy cars, hot rods—all are indigenous to this country and add to the diversity of the hobby.

Despite all this growth and diversity, I see some problems that could be detrimental to the R/C car hobby and we *must* address these. Foremost is the race organization, ROAR. We get nothing but negative letters concerning the races and rules that ROAR is involved with—especially rules concerning stock motors. Costly stock motors are discouraging new racers from participating at local races, and this will jeopardize the future of the hobby. I personally question the motivation of this organization and what its objective really is, and so should you. Let's not put the future of this hobby in the hands of a few short-sighted individuals. Let's hear your comments.

There's a similar type of organization that's the governing body for, among other things, radio-control airplane modeling, and it has done virtually nothing to foster the growth of R/C airplanes. Called the Academy of Model Aeronautics (AMA), its interests, in my opinion, are totally self-serving and have stifled the growth of the sport. Let's not have a repeat performance with the R/C car hobby. ■



Publisher Louis DeFrancesco, Jr. (left) with astronaut Hoot Gibson—he digs R/C!

NOW YOU CAN GET THE ONLY R/C CARS TO BREAK THE SOUND BARRIER.

MERCURY

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The Mercury Xi-4 is a 1/10 scale radio control car has many features which give it a distinct advantage in competition racing: four wheel drive (3 differential/2 belt system), unique adjustable independent suspension with extra long oil-filled adjustable shocks, durable low-profile pin spike tires mounted on QuikChange™ one piece chromed rims, highly efficient linear speed control, durable aerodynamic polycarbonate body & wing, weather resistant power train housing and radio/battery compartments, monocoque ABS resin frame, RS-540 motor and ball bearings. Requires a BEC 2 channel radio & a 7.2VDC flat pack (not included). Order #10102



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require a 2 channel radio, and a 7.2VDC hump pack (not included).

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Letters

(Continued from page 10)

to put me out near Sacramento, CA. R/C cars are in my blood, and I would love to hear from some clubs out in that area. Anybody who would like to give me the advance lowdown, please drop me a line.

WAYNE M. HALL T.Sgt., USAF
48TFW/DOI PSC Box 844
APO NY 09179-5362

I'm a former racer at the beautiful Lake Whippoorwill International Speedway, but a tour in the Army has put a halt to that. I'm now in the Frankfurt, Germany area and looking for a place to race. If you or anyone out there can help me out, please write to me at the address below. I'll race anything!!

PFC JOHN GROSS
109th MP. CO.
APO NY 09079
W. Germany

Wayne and John, we at RCCA are more than happy to help a racing serviceman out. Let us know how things turn out. If there are any other people overseas who need help, drop us a line.

CC

From Brazil

We get RCCA here in Sao Paulo, but at twice the price. Nevertheless, I always buy it. We have few shops for R/C in Brazil, so I buy my parts and components usually in Europe. My preferred scale is 1/12 on-road race cars. Maybe you could help me. I'm looking for a GTP ZX-Turbo Nissan, a Ford—I believe C-100—it's the 4-cycle Turbo 2100cc Imsa Racer), a Jaguar XJR 9 and a Porsche 962, all of them in 1/12 scale.

I'm scratch-building two R/C cars. The first is an off-road 1/10-scale Toyota pickup that was only a toy in its original form (8mph maximum speed!), but the body is very nice, and beautifully detailed injection-molded plastic. The only remaining parts that were used are the body and the wheels, without tires (too hard). The other parts were fabricated from anything that could be used, for instance: leaf springs at the back, independent suspension at the front with coil springs and so on. I'll send you

some pictures and details on how everything was done when they're ready. Maybe you'll even publish it as a special feature!

The second one is a 1/12-scale 280 ZX Datsun Imsa racer (clear Lexan body made by BoLINK) with a Kyosho 360 Gold LeMans motor in central position, independent suspension on all four wheels, micro shocks and disc brakes on the front wheels actuated at the same time as the electric brake of the motor. The cars aren't finished yet, because I have little spare time. Excuse me if there are some grammatical errors: English is my fourth language, and I sometimes mix up things, and I hate typewriting.

PIERRE ROSSETTI
Rua Arq. Jaime Fonseca
Rodrigues, 645
Alto de Pinheiros
05446 Sao Paulo - SP

Buenos dias, Pierre, it would be great if you could send some photos, black-and-white prints and/or color slides (no color prints), of your scratch-built projects. As to your questions about availability of certain 1/12-scale Lexan bodies, here are the answers: The GTP ZX-Turbo Nissan and Ford C-100 are not available at this time, but the Porsche 962 is made by Tamiya and the 280 ZX Imsa Datsun is now available from BoLINK.

Don't worry about the grammatical errors; many can't even master one language. Hasta luego!

CC

Can't Hold It Any Longer

I want to modify my Blackfoot, and I'm not sure just how to do that. I've been waiting to see if you'll put an article out on it, but I can't wait any longer.

Could you please do an article on it? I'd really appreciate it.

MARK FORDEN
Williamsville, NY

Mark, thanks for the letter. The May '88 issue of RCCA has a "Budget Blackfoot" article by Dick Brinton. Just think, relief is just a back-issue order away!

CC

(Continued on page 50)

PART II

PROJECT FALCON

ON THE WING!



BUDGET RACER

by DICK BRINTON



Rear wheel showing lightening holes and screw weights needed to achieve a good balance.

IN THE LAST issue of *Radio Control Car Action*, I described how I assembled Tamiya's* Falcon. I followed the manufacturer's directions, except for re-routing the antenna wire further away from possible motor noise interference and, of course, installing a full set of bearings. (Both Trinity* and Aerotrend* produce good-quality, full sets for the Falcon.) Then I track-tested the car and made notes on problems and areas for increasing performance. Here are my results:

The major shortcoming of the stock Falcon is a strong tendency to "push" or understeer. The car would actually run wide off the track when the stock, ribbed front tires lost their grip.



To increase downforce, wing is installed upside-down with trailing edge cut free and bent up.

In addition, the rear spring/damper units weren't tuned for the bumpy track.

There are a number of ways to correct understeer, but the most effective way is by changing tires. As a matter of fact, about half the handling problems on any R/C car (or any race car) can be corrected by using the right tires. If you haven't experimented with tire changes, you may be missing an important key to winning.

I replaced the ribbed front tires with MRP's* fine 35-4029 tires, which feature a combination rib and knob tread. I used Pacer's* Zap to keep them in place, and in all the tests (including a heat race), the tires stayed put until the car whacked the wooden track barrier at high speed. Even then, the affected tire

BUDGET RACER

stayed on the rim, though it did develop a comical wobble.

The result of this tire change was almost magical. The Falcon's front end began to stick very well, and this made the rear spring/damper control problem even worse. Sometimes this happens; when we correct a handling problem on one end of the car, something happens at the other end, and that needs correcting.

Let's explore the reasons for this. When the Falcon had a bad understeering problem, its limited speed

through the turns resulted in slower lap times. When the front end had been fixed, the car could be driven much faster all the way around the track, and bumps that previously hadn't upset the rear suspension caused problems at this higher speed.

Sometimes, as you practice and become a better driver, you'll think your car's handling is going away when it might just be that you're driving it faster and the car can't handle the higher speed without a handling "tune-up."

In addition, when the Falcon's front end sticks better, any traction problem at the rear usually gets worse. When the front end was washing out, the rear tires were just along for the ride, but with the front tires sticking well, the rear tires had to work harder, and this overtaxed the rear suspension. Here's how I improved the rear suspension:

First, I turned my attention to the rear spring/damper units. I removed the spring collars to take the pre-load off the springs. Remember, one of the ways to increase the traction is to soften the spring action at the wheel where you want to increase the traction. Since the rear tires weren't biting as well as I wanted them to, I softened the rear springs.

To determine whether the springs were still too stiff, I emptied the oil out of the dampers and then returned to the track. As expected, on any major bump, the springs compressed completely. You could hear the suspension hit the limits as the car went out of control.

This told me the springs weren't too stiff. I checked my notes and saw that the rear suspension was used up on jumps even before I softened the rear springs.

To bring balance to the Falcon's rear suspension, I increased the weight of the dampener oil, mixing equal amounts of 10WT oil (the oil I dumped out was 10WT) and 20WT oil. This gave me approximately 15WT oil. The higher the weight of the oil, the greater the dampening effectiveness of the shock. This combination of softer springs with slightly heavier oil seemed to work best on this track...on this day!

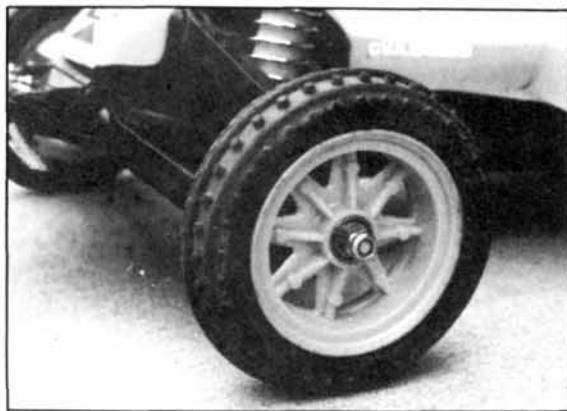
Do you remember that when assembling the Falcon, I discovered that the rear wheels were badly out of balance? It turned out that one was bad enough to bounce the wheel at high speed. By fixing this, I improved traction. For off-road, the balance doesn't have to be perfect, but it must be close.

In the photo, you can see the holes drilled to lighten the rim and the two screws used for additional weight. This wheel/tire combo was really bad. Incidentally, before you balance a wheel, try moving the tire 180 degrees on the wheel. This will sometimes help, especially if you have a heavy spot in the tire right over a heavy spot in the rim. Don't forget to Zap them so they stay in place.

The Falcon could use a front stabilizer bar. Since I haven't yet developed one, I decided to reverse the front wheels to make the front end wider. I gained a full centimeter and increased stability coming off jumps and especially around high-speed sweepers—not bad for a one-minute, no-cost change!

Then I realized that the rear wing was shaped so that it worked better upside-down! I modified it by cutting the trailing edge loose from the sides, and I ended up with a shape like an under-cambered airplane wing

(Continued on page 50)



Front wheels are reversed to gain one centimeter and to help stabilize front end.



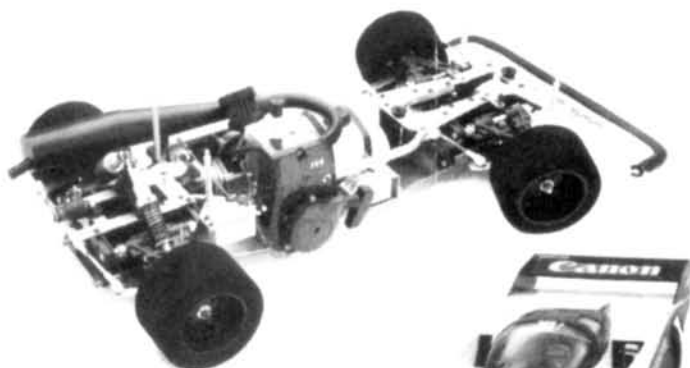
Short screw holding body pod tightly against the chassis tub to keep dirt out.



The Inside Scoop

by CHRIS CHIANELLI

THE R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!



BLOWN AWAY BY DWA

Here's a picture of DWA's BLU 2 that's now distributed by Condor Trading of Laguna Hills, CA. I took one look at this car at the Chicago RCTHA Hobby Show, and in about two seconds the words "serious business" came to mind. It has things like: upper and lower A-arms all the way around with front and rear anti-sway bars; a 4hp 10,000-plus 30cc motor; a differential; all-around ball

bearings; alloy and nylon construction; and four disc brakes. Are you starting to get the picture? Oh, yeah; the tuned pipe is included. Looks like this car is equipped to kick some you-know-what!

* * *



THE BULLET IS FIRED

The Traxxas 1/10-scale 2WD Bullet, which appears to be an A-Main contender, is now available. As soon as we get one, we'll give you a close look.

* * *

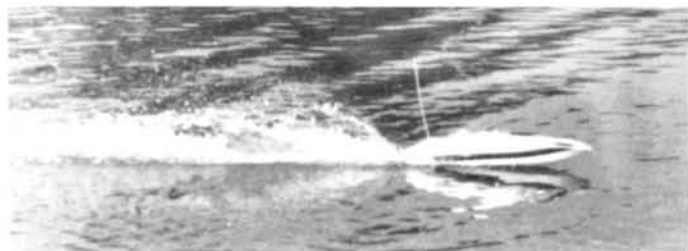
CHECK THE PRESSURE

B&L Racing Products of Buena Park, CA, is now producing its line of pneumatic 1/4-scale tires. Rumor has it that these tires are licensed under Goodyear and bear the famous logo.

* * *

FLASH!

By January 1, 1989, the BRC10L, Associated's new 1/10-scale on-road car, will be ready for shipment. Results from recent regional racing have been impressive, and all is "go" for full production.



PARMA PROLIFERATION

In response to your demands, Parma International, Inc. will soon introduce a monster truck conversion for none other than the Tamiya Hornet. Of course, this conversion kit will work equally well on the Grasshopper.

With Parma's reputation for product proliferation, it should come as no surprise that they're branching out into the boat and airplane market. The Aero Sprint is an ARF (almost ready to fly) that comes pre-covered, is powered by a 540 motor, and has a 50-inch wingspan.

Joining the already available deep-vee Ski Tiger, Parma's latest R/C race boat



is a scale version of the 5-liter Follansbee Hydro, which is sponsored by Follansbee Dock Systems. Like the Ski Tiger, the Hydro utilizes a superior surface-drive propulsion system instead of an underwater drive; thank you very much, Mr. Parma. Both boats use all the electrics used in 1/10-scale cars, i.e., motors, chargers, batteries, radios, etc.

* * *



GOLDEN BABIES

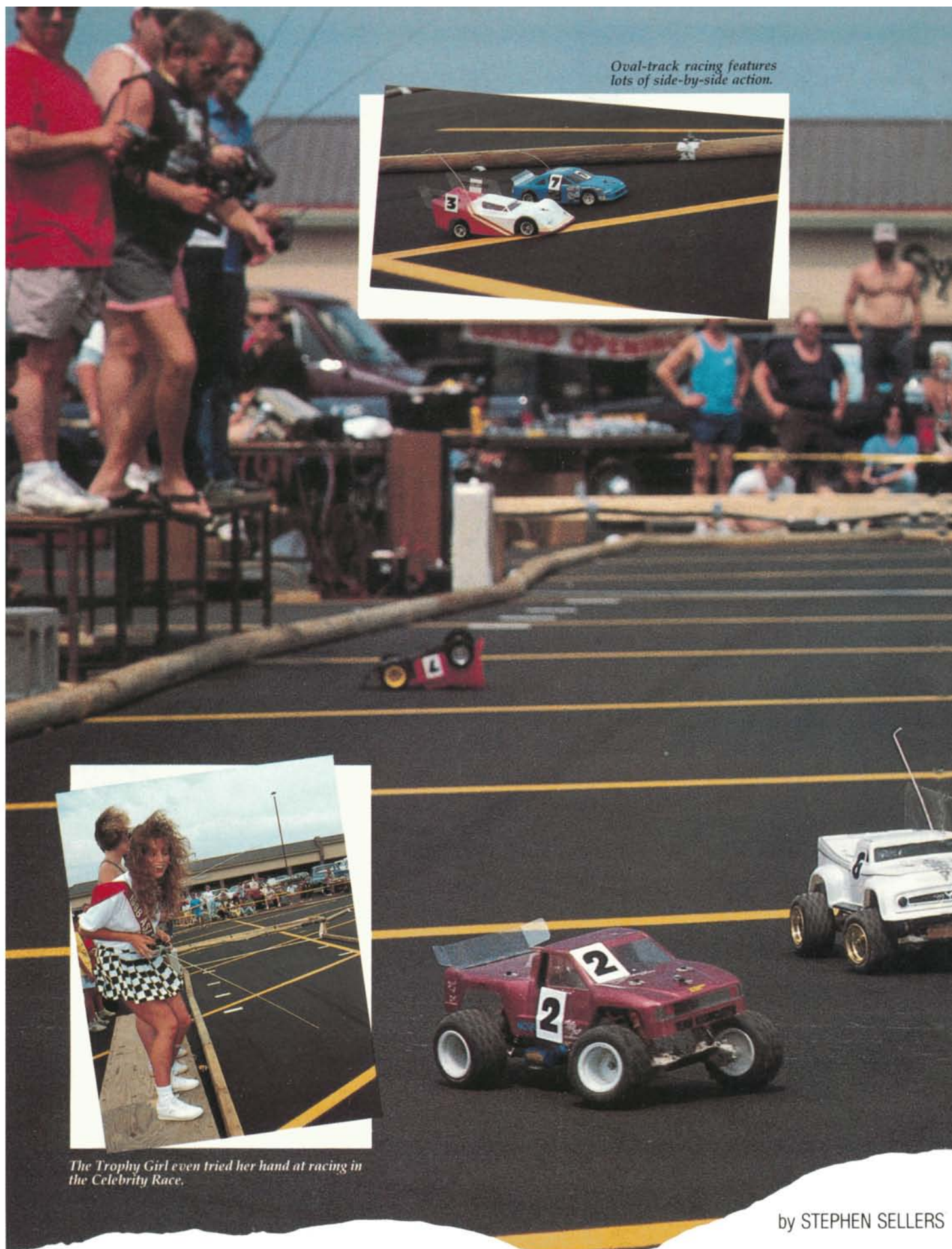
No, not the Rockettes: I'm talking oil-filled, coil-over, anodized aluminum

Kyosho Gold Shockettes—sorry, I couldn't resist! Anyway, these small shocks have the same design as the well-proven standard-size Gold shocks. The Baby Golds are very good replacements on cars like the Raider and Pegasus, and, of course, many others.

Keeping the industry BUGGED, see you next mission....

CC

Oval-track racing features lots of side-by-side action.



The Trophy Girl even tried her hand at racing in the Celebrity Race.

by STEPHEN SELLERS

A man in a white shirt and blue shorts is running on an asphalt track, pushing a large log. In the foreground, two radio-controlled cars are on the track, one of which is partially on the log. The background shows a crowd of spectators and a building with a sign that says "more".

INDIANA ASPHALT OVAL CHAMPS

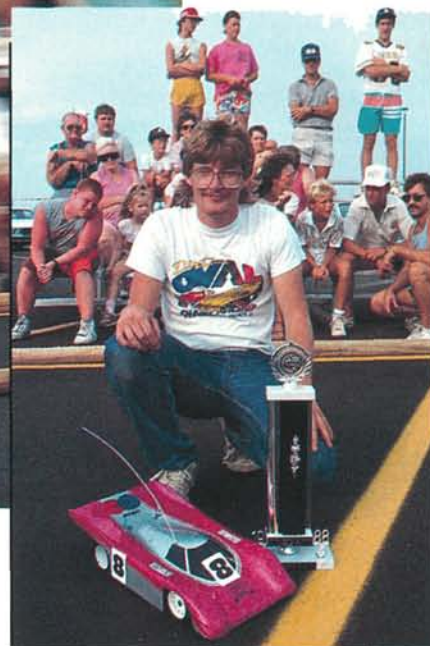
TARMAC MADNESS

IT DIDN'T TAKE LONG for nearly 100 entrants in the Indiana Asphalt-Oval Championships to realize that they were part of a very special event. On August 14, a steamy Sunday afternoon, Anderson, IN, rolled out the red carpet for some of the top radio-control racers in the Midwest. The Indiana Championships were the climax of the week-long Anderson

INDIANA ASPHALT



Above: The Modified Class goes flying by—not even stopping for the camera.
Left: These trucks decided to do some mutual car-crushing, instead of pedal-to-the-metal racing.



David Whitsel was the proud winner of Concours at the Asphalt Oval.

400 Festival. The night before, the city hosted the 22nd Annual American Speed Association 400 on the fastest quarter-mile oval in the world—the Anderson Speedway. Anderson hosted the first ASA-sanctioned race back in 1966, and ASA keeps its headquarters nearby.

On Sunday, R/C racers from Indiana, Ohio and Michigan stood toe-to-toe on the freshly paved parking

lot of the PayLess Supermarket, sponsor of the Anderson 400 Festival.

The day's activities were spiced up with an announcer, race queens and celebrity challenge races, but the biggest treat of all were the two Indy Cars that were unloaded from their trailers just before the first heat.

Anderson isn't much more than a stone's throw from

Show Cars?

With full-scale Indy cars costing over \$100,000 to put on the track, how can race teams afford to put them on display? They don't usually have any choice.

Presently, Indy cars are obsolete after running only one racing season. From one year to the next, not even a single part on these cars is interchangeable. Rule changes and advances in technology combine to put last year's "hot ticket" on display in parking lots. The only recent exception to this rule was also on display at the Asphalt Oval Champs: Randy Lewis's 1987 Toshiba-sponsored March. The 1987 Marchs were even obsolete in '87! At the 1987 Indy 500, teams found out that the '86 Marchs were faster than the '87 versions, so they



scrambled to get their '86s off the show circuit and back on the track. Many obsolete '87 Marchs were sitting in parking lots even in 1987.

the Indianapolis Motor Speedway, so everyone really enjoyed peering into Randy Lewis's 1987 Toshiba March and Bobby Rahal's 1983 March, which was freshly painted in PayLess colors.

Some pretty heavy hitters turned out for the event, and all eyes were on the boys from Dayton, OH. Mike Seybert, under the aegis of TQ Engineering, Accu Charge and Twister, was top qualifier and finished in third place in the 1988 ROAR 1/12-scale, 6-cell Nationals. His credits also include a third-place finish at the 1987 Indoor Nationals, and a TQ and victory at the Parma Championships. Bernie Piatt and Mike Overbay, also from Dayton, brought along some impressive credentials as well: Piatt finished third in the B-Main in this year's Canadian Nationals, and Overbay finished third at the Parma Championships earlier this year.

Seven classes were contested: Production, Truck, 1/10-Scale Stock, 1/10-Scale Modified, Road Wizard, 1/12-Scale Stock and 1/12-Scale Modified. Races were six minutes long, and three qualifying heats led up to the final. The racing surface was fresh asphalt—smooth, but murder on tires. Tony Baginski, owner of RPM Racing, laid out a 320-foot oval featuring two 82-foot straights. Inner and outer walls made of landscape timber lined the 12-foot-wide track.

The 1/10-Scale classes provided the best racing of the day, and the Ohio connection was in the thick of it. Driving a prototype TQ Eagle powered by a Twister motor, Mike Seybert TQed in 1/10-Scale Stock with 38 laps to his credit, while second-place qualifier was Mike Overbay, with 36 laps.

The final was a very clean, professional race. From fourth on the grid, Scott Linder, of Indianapolis, got the jump on the field and showed everyone his tail. In just nine laps, his Linder Electric prototype built a 3/4-lap lead on the second-place runner (Seybert), but coming out of turn four to begin his tenth lap, Linder grazed the outside wall. Like so many competitors before him, Linder discovered that landscape timbers aren't very forgiving: His right front suspension was broken, and he was out of the running. Seybert inherited the lead and was never challenged, finishing one lap ahead of Overbay and Bob Yelle. Overbay, who piloted a TRC Pro-10 Twister, edged out Yelle by just .3 second at the line. Yelle attempted several passing maneuvers going into the turns, but

OVAL CHAMPS WINNERS

2WD STOCK

Name	Car	Motor	Speed Control
Mike Seybert	TQ Eagle	Twister	Tekin
Mike Overbay	TRC Pro-10	Twister	Novak
Bob Yelle	Scratch-built	Associated	Novak

2WD MODIFIED

Name	Car	Motor	Speed Control
Bernie Piatt	TRC Pro-10	Twister	Novak
Terry Watson	TRC Pro-10	Linder	Tekin
Mike Seybert	TQ Eagle	Twister	Tekin

TRUCK

Name	Car	Motor	Speed Control
Ed Robinson	RC10/JG Conversion	N/A	Novak
Mike Dozier	RC10/JG Conversion	Cam	Novak
Trent Norris	Big Bear/Scratch	Race Prep	Novak

1/12-SCALE STOCK

Name	Car	Motor	Speed Control
Cam Hindman	12L	Associated	Novak
Brad Hayes	12L	N/A	Novak
Chuck Loyd	12L	Revtech	Novak

1/12-SCALE MODIFIED

Name	Car	Motor	Speed Control
Bryan Kattman	12L	Cam	Novak
Chuck Loyd	12L	Associated	Novak
Mike Davis	12L	N/A	Novak

Overbay met the challenge each time and cleanly slammed the door shut.

Yelle had one of the most interesting chassis at the event. The Indianapolis native picks up carbon fiber that long-time Indy car crew chief Wayne Leary salvages from broken racers. Add suspension, electrics, and a few odds and ends, and you've got a pretty sturdy R/C racing chassis.

The 1/10-Scale Modified Class saw a series of incredible duels between Seybert and Piatt. Their third qualifying heat

(Continued on page 63)

Chemical Warfare

HOW TO SURVIVE THE RACETRACK BATTLEFIELD

by ERIC GOLDSCHRAFE

IN THE BATTLE for first place on the racetrack, it's generally accepted that the fastest car will win, if all other factors are equal. If somebody came along and said he could make your car go faster *without* changing *anything*, you'd probably listen, right? Well, pay attention, because there's a whole bunch of stuff that will do just this, and it's all available from your local hobby shop. Claims such as this are usually met with some skepticism, but these products work, and, in some cases, the more miles on your car, the better they seem to work.

One of the biggest enemies of a winning performance in R/C cars is plain ol' *dirt*. Dirt's a fact of life, even for on-road and carpet-track racers, but especially for off-road machines. As soon as grit and dust get into the car's moving parts, friction builds up and parts begin to wear out. The handling may go away (due to stiffening of the suspension), and battery life shortens. You can't wrap the whole car in a plastic bag when you race it, so you have to learn to cope with the problem. Moving parts generally need some sort of lubrication to keep things running smoothly, but standard oil and grease attract dirt like magnets attract iron filings.

Paragon Racing Products* makes some excellent products that can help here; they go on wet and then dry to form a lubricative film that won't attract dirt. Liquid Bearings is a formula that's applied wet to the bearing (or other moving part) and dries in seconds. Right out of the bottle, you can use it on gears and ball joints (listen to the difference in gear noise—you can *hear* it work), or in ball bearings or sintered bronze bearings and in differentials, in a thinned-out mixture. Paragon's Formula 1 should be used to dilute the Liquid Bearings and also to clean out the bearings before applying the new lubricant. The bearing should be soaked in Formula 1, and, while still wet, dabbed with the lubricant. Spin the bearing until the film dries; the lubricant particles will migrate throughout the bearing, forming the dry film that will really reduce friction.

Ultralon is another Paragon fluid that offers excellent lubrication, even in the most dusty environments. This product may be used the same way as Liquid Bearings, but to thin it or to pre-clean parts, use common lacquer thinner instead of Formula 1. Both lubricants can be used very successfully on gears, if the gears are set up to the proper tolerances first, but Ultralon works best. Set the mesh in the usual way, and then apply the lubricant. Spin the gears until the film dries and it will slightly fill in the slop. You'll hear the noise reduction, and it's guaranteed not to attract dust! Use this stuff in the ball ends on your steering components, and also on moving suspension parts to free up the action and reduce wear.

(Continued on page 90)



Above: BoLINK's chemical line-up includes a motor cleaner, liquid horsepower and traction additives for specific types of racing surfaces.



Above: Ultralon, by Paragon, works well in gearboxes and on nylon parts.

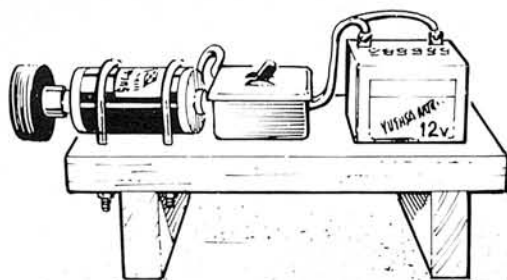


Above: Paragon's Liquid Bearings goes on wet and dries into a slick film.
Left: Dan's RC Stuff Motor Spray is non-toxic and has 20 ounces squeezed into a 16-ounce can.



Pit Tips

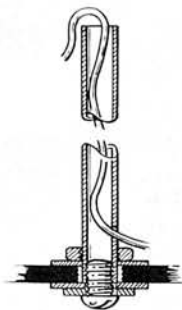
by JIM NEWMAN



STARTER BENCH

Make a simple bench from lumber, bolt your starter to it with hardware-store U-bolts, attach a utility box containing a regular household light switch and mount your battery on the space remaining. I haven't shown it, but the battery should be secured to the bench with a suitable clamp or rubber strap to prevent accidental upsets. You could also raise the bench on a simple folding sawhorse arrangement so that you don't have to stoop.

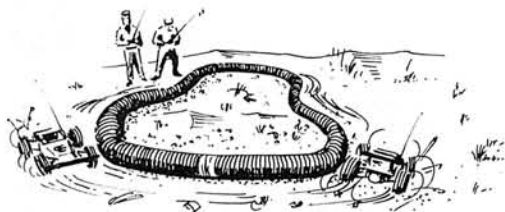
Eric Smevold, Long Grove, IL



ANTENNA FISHING

On his Tamiya cars, this frustrated owner spent much time trying to thread his antenna wire up inside the plastic hollow mast. Finally, he sucked a thread up through the tube, tied the wire to it and pulled it through! Note the little barb he cut into the antenna insulation to prevent the thread from sliding off. Another method we've heard of is to CA fine florist wire into the end of the antenna wire, then push that up through the mast first.

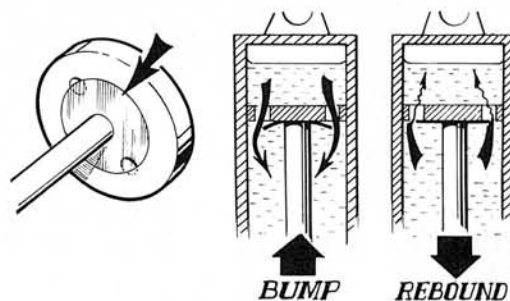
Troy Turner, Riverton, UT



TRACK BARRIER

For clubs short of funds, lengths of 4-inch flexible plastic drain piping make an excellent resilient, inside barrier for your track. These lightweight sections can be held together with a couple of wraps of duct tape, and can be quickly disassembled and rolled up to fit into the car trunk.

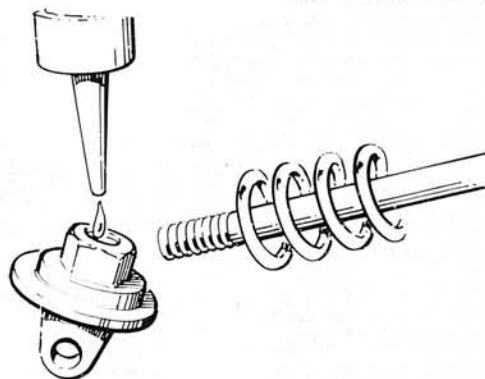
William T. Lee, Gordonsville, VA



TUNING SHOCKS

The rebound return speed is governed by the flow rate of oil back through the piston holes. Smaller holes mean stiffer shocks. Cut a diaphragm (arrowed) from a thin plastic bag, then trap this between the piston rod and the piston. Trim the plastic as required, so that it partly covers the holes, thus varying the amount of restriction. A series of diaphragms, all coded against various tracks, can be kept in the tool kit and installed when appropriate.

Jeff Arcuri, Phoenix, AZ



STRIPPED THREADS

This car owner managed to strip the threads on the end of his Boomerang shock unit. He made a simple repair by dropping CA into the damaged thread and presumably rolled the unit around to spread the glue inside the hole. When the glue had set, he screwed the piston rod back into the hole and found it worked great!

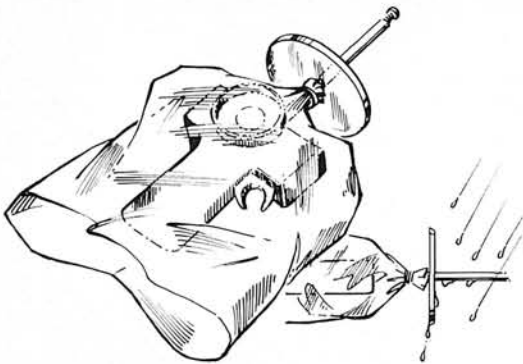
Darren Brown, Sylmar, CA



REPLACEMENT ANTENNA

Here's a problem with a Boomerang 4WD. On a roll-over, the metal rod antenna punched right through the chassis. This inventive owner took a length of plastic tube, drilled a small hole in the side and threaded a flexible wire antenna up through the center. By using a series of washers to cover the hole in the chassis, he retained the tube by threading a screw into the nylon tubing from below. I have also shown a nut threaded over the outside of the tube above the chassis, because I know it can be done. He showed us a regular nylon tie-wrap, which will also work.

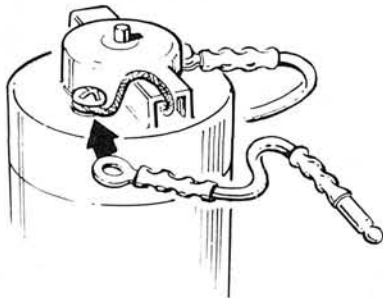
Luke Panchal, Johnsonville, Wellington, New Zealand



TRANSMITTER RAIN MITT

If you insist on racing in the rain, here's how to keep water out of your transmitter and prevent short circuits. Cover the unit with a large plastic bag, keeping the bottom open to allow your hands to enter. Securely tape the top end of the bag around the antenna, then punch a small hole in a plastic butter tub lid and force this down over the antenna as far as the bag. The lid will shed any water that runs back down the antenna rod.

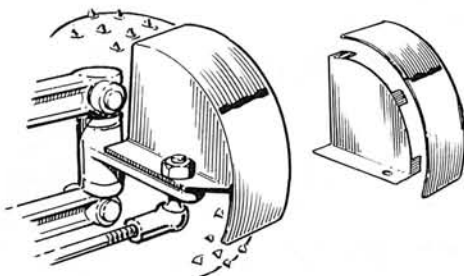
Virachat Boondharigputra, Bangkok, Thailand



SOLDERLESS CONNECTIONS

Never having had much success with soldering leads to motors, our contributor now uses crimped solderless connections everywhere on his cars. To a short piece of connecting wire, he crimps an eye-type terminal lug with a male plug-in terminal at the opposite end. The eye-type goes under the screws holding the motor brush leads. Naturally, the female connectors go on the leads into which the motor leads will plug. He advises that he sometimes has to snip one edge off the eye lugs to make room next to the bearing housing. Caution! When using crimped connectors, we strongly advise putting female connectors on all live leads, e.g., the battery leads and controller leads, so that the live connections are shielded inside the insulating plastic sleeve. Connectors for crimping pliers are inexpensive and are sold at hardware stores.

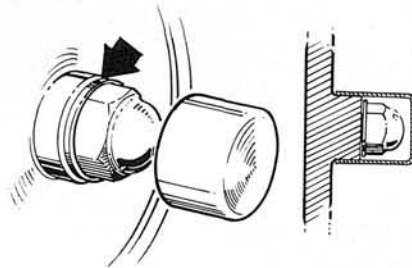
Tomas Freeman, Newberry, FL



SIMPLE FENDERS

Obviously fed up with the filth spraying back from his front-wheel drive, this owner soldered fenders from thin tin plate and bolted them to the steering arm using the existing bolt. I imagine that you could also cut out a section of soft-drink can to serve the same purpose.

Pete Hensing, Kalispell, MT



WHEEL BEARING DUST CAPS

Dirt was getting into his unprotected wheel bearings (arrowed) and causing the wheels to stiffen up on their axles, so this owner molded (vacuum-formed?) some little plastic caps which he pressed over the retaining nut and onto the wheel hub. This, he says, has cured the problem. A short piece of rubber tube with one end plugged with caulk would also do the job.

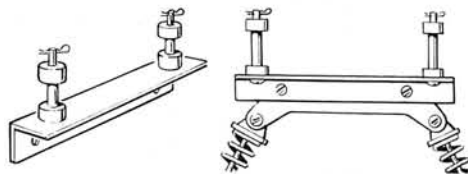
Jason Pilgrim, Matheson, Ont., Canada



LUBRICATING BEARINGS

A proven method used by full-size racers: Cut down a soup can, drop in a generous quantity of petroleum jelly and place it on a coat-hanger wire stand high enough over a Sterno flame to melt (not boil) the grease. Place the bearings in the melted grease, remove the flame and allow the grease to solidify. When cool, extract the bearings and wipe the excess grease from the outside. Your columnist was advised to keep the bearings off the bottom of the can, by supporting them on a screen wire platform to allow convective circulation around the bearings. It's a good theory and can't hurt! Caution: We advise carrying out this operation outside and wearing safety glasses.

Jeff Arcuri, Phoenix, AZ



OPTIMA BODY MOUNTS

This simple system will allow Optima owners to convert a full stocker or truck body, and will probably work on other chassis also. The system uses regular Parma Universal mounts in conjunction with pieces of light aluminum angle, which are then attached to the suspension cross-members. Our contributor also drilled additional holes in the cross-members to allow the shocks to be repositioned higher or lower to alter the car's ride height.

Hayward L. Butler, Jr., Roskilde, Denmark

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

Still alive and kickin'—the rear-engine Optima series

by STEVE POND

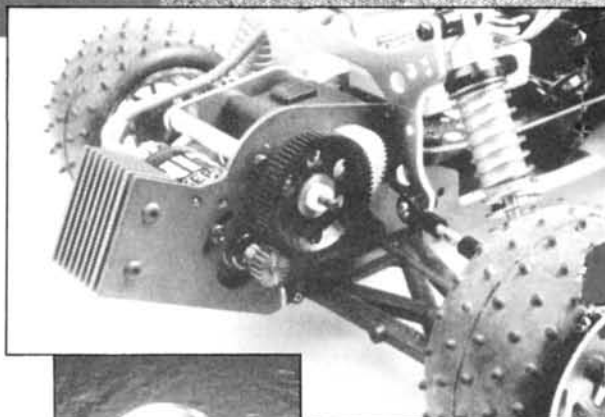
AT ONE TIME CONSIDERED to be the flagship of the Kyosho* off-road line, the Optima/Javelin was once at the leading edge of technology with its slender aluminum and fiberglass chassis, idler-arm steering, lower A-arms with adjustable upper links and an efficient chain-drive system with differentials front and rear.

PROJECT JAVELIN

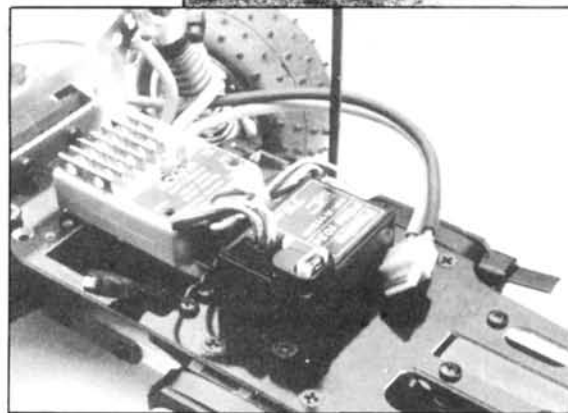
Since the introduction of Kyosho's latest 1/10-scale off-roader—the Optima Mid—many have scrambled to hobby shops to scoop up these newcomers, leaving their old Javelins in the stables to collect dust or toting them to the auction block. Designed to cure the inherent understeer of a 4WD, its motor's mid-mounting position has transferred more weight to the Javelin's front end. However, this can also cause the front end to go nose-down when catching some air. The Javelin's rear motor mount will cause understeer, but it will also allow for more predictable flight.

With the introduction of numerous optional factory parts, as well as a broad range of after-market parts, you may have to look at the Javelin in a new light. Some of its newest, and most significant, accessories come straight through the factory pipeline. With the introduction of the belt-drive Optima Mid, Kyosho also produces a belt conversion kit for the Optima/Javelin, and this belt conversion, when used in conjunction with the optional ball differentials, will allow much more adjustability. The belt itself virtually eliminates the stretch that's so common with chain drives, so it reduces the amount of maintenance needed. The new Kyosho ball differentials are available for the front and rear of the Javelin. They'll allow you to bias the power to the front end, and the front wheels will *pull* the car through a turn instead of having the rear wheels *push* it through, as is the case when using bevel-gear differentials. Further, the power is evenly distributed, front and rear. Our project car started as a stock kit, and, with a few extra parts, the Javelin had a new lease on life.

As you may have gathered, I started by installing a

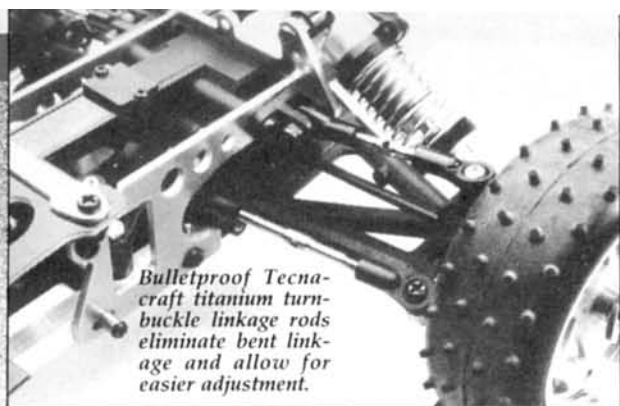


Top: Robinson Racing's 48-pitch conversion for Optima-type cars makes for a smoother, more efficient drive system. Above: Beautiful new Tecna-craft Spokes wheels will allow the use of narrow Cat front tires.



The Novak 1X transferred power to the motor, while the new Futaba PCM provided guidance.

Kyosho belt conversion and ball differentials. This sequence was simple, but there's room for error when following the rather vague instructions, which discuss installation in both the Mid and the standard Optima configuration. And don't take it for granted that there are extra parts! If you follow with a close eye, you should be able to get through without any hitches. Once complete, the front diff is installed in the existing



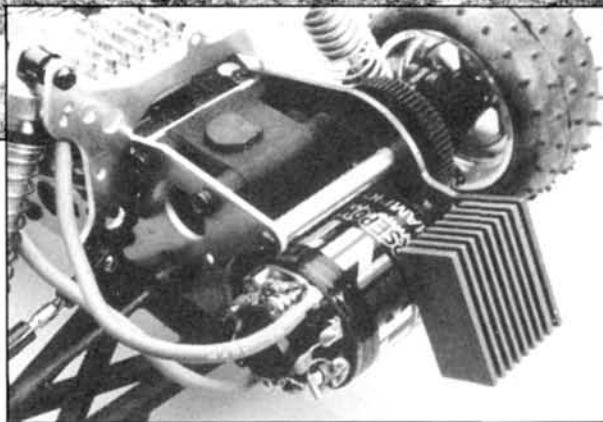
*Bulletproof Tecna-
craft titanium turn-
buckle linkage rods
eliminate bent link-
age and allow for
easier adjustment.*



housing and the rear diff is installed in a new housing that's included in the belt conversion kit. With the two housings in place, the lion's share of the project is completed. The motor-mounting plate is replaced by a Litespeed* heat sink. There has been a lot of armchair speculation about how effective a heat sink actually is, but if you pick up your car at the end of a run and the heatsink is hot, it has successfully extracted heat from the motor. When the heat sink had been installed, a set of Robinson Racing* 48-pitch gears replaced the original equipment that transmits the power from the motor to the rear diff. The Robinson gears are molded and machined to more precise tolerances than the original factory gears, and this has numerous benefits.

The suspension was next in line, with a

Trinity No. 2002 Sprint motor provided gobs of power, while the Litespeed Optima Lite-sink kept things cool.



couple of minor improvements: The old, red, anodized shocks were tossed in favor of a set of Kyosho Platinum shocks. Without a shock-pressure gasket or some means of soaking up the displaced oil in the shock chamber when it's compressed, air will be left in the shock and this will cause the oil to foam, so adversely affecting the shock's dampening properties. Upper links and tie rods were also replaced with Tecna-craft's* Ti-Rods. These are

(Continued on page 112)

BME RC10 CONVERSION

OFF-SET FOR OVAL RACING

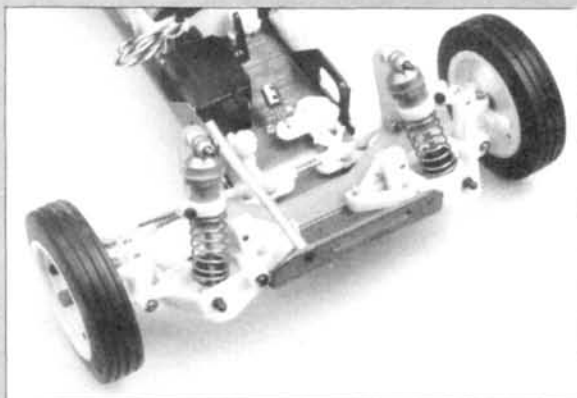
by RICH HEMSTREET



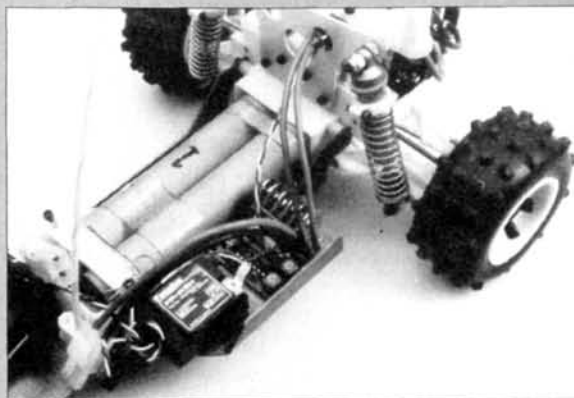
Associated's RC10 is decked out with a modified body, and it's ready to go oval-track racing with its new BME chassis.

ALTHOUGH DIRT-OVAL RACING continues to grow in popularity, many racers are still using their off-road cars to run the ovals. This is especially true in the 2WD class, where there isn't a single car designed specifically for this type of racing. But there are many chassis and suspension accessories available to adapt Associated's* RC10 to dirt-oval racing. One of the latest is produced by B Mack Enterprises* (BME),

It only takes an hour to replace the stock, gold-anodized, aluminum tub chassis with the narrow, blue, aluminum chassis. The only instructions included in the kit were in a drawing that showed how the chassis and front clip bolt together. It was necessary to drill holes to mount the Futaba* S-32 steering servo; otherwise, everything bolted right in. The speed controller is servo-taped to a side pod that sticks out on the left side of the



BME's wide-foot front end is offset to the right, thereby shifting more weight to the left tires.



A raised side pod provides the mounting point for the receiver and electronic speed controller.

which offers a replacement chassis that preloads weight to the left side of the car, and this is exactly where you want the weight for oval-track racing.

chassis.

BME accomplishes the left-side preloading primarily by means of its front suspension clip.

(Continued on page 38)

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10067 RA5852 Newman Porsche	164.40	\$116.95
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23101 RA5855 Boomerang	192.70	\$136.95
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23604 RA5862 Hot Shot II (4WD)	224.95	\$164.95
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10069 RA5864 Toyota Celica Rally	299.95	\$213.95
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11630 NEW!! Thunder Dragon	179.95	\$124.95

BME RC10 CONVERSION

(Continued from page 36)

A wide-foot suspension spacing is used on the front clip. This alone should have the effect of increasing the weight on the rear tires, while decreasing some over-steer tendency. But BME takes this one step further; they also offset the front clip to the right. The left front tire is the same distance from the center line of the chassis on the BME as it is on any stock RC10. The other front tire hangs way out on the right-hand side. With the battery pack mounted down the center of the blue chassis, most of the weight is slightly biased to the left of the tires' center line.

I installed a Pro-Trix 555 by MRP* for track testing. This motor has good power and makes time easily on the oval. For a low profile, I used a BoLINK* Cavalier Modified body. While the BME RC10 works well on the dirt, it does have some shortcomings: The long, side-bar braces on the chassis are very brittle. Neither one fits properly, and they both broke while being reshaped to fit. The stock RC10 front braces will work with this chassis.

The primary benefits of this design could be duplicated on a stock RC10 tub by simply adding the BME offset, wide-foot, front clip and shock tower. The narrow chassis offers no real benefits, and even limits the possibility of offsetting the battery pack. BME's shock tower maintains the standard upper and lower shock-mount relationship, which means there's no provision for lowering the RC10's tall ride height. A serious oval chassis design should address the need to lower the center of gravity. While BME offers a sharp-looking replacement chassis that will make your RC10 stand out in a crowd, it probably won't get you to the front of the pack.

*The following are the addresses of the companies mentioned in this article:

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

B Mack Enterprises (BME), P.O. Box 2066, Bricktown, NJ 08723.

Futaba, 555 West Victoria St., Compton, CA 90220.

MRP, 18676 142nd Ave., NE, Woodinville, WA 98072.

BoLINK, 420 Hosea Rd., Lawrenceville, GA 30245.

M R P HIGH ROLLER

Track Report

by DAVE McNATTIN

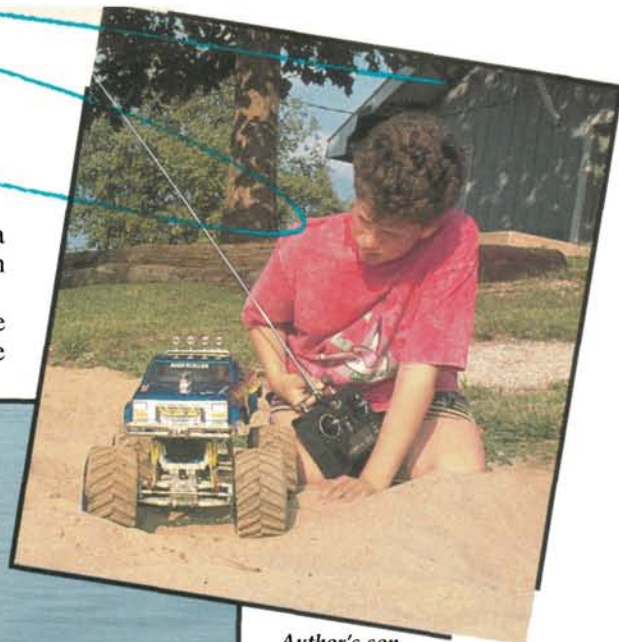
LET'S GET THIS STRAIGHT right at the beginning: MRP's* High Roller is a great truck simply because it goes where others can't—from high ground to high seas. When this baby charges to the water at full speed, all your boating buddies will drop their teeth. This truck is perfect for the lake shore and great on dirt tracks or baseball diamonds, too—or, for that matter, *anywhere!* And there are plenty of other good things to say about this truck: It's easy to run, will go just about anywhere (land *or* sea!) and it's relatively easy to build. It's quick, handles like a champ, and is as tough as nails.

This is a very big truck. Weighing in at well over 8 pounds, it uses 16 shocks to



cushion the ride, so it can handle nearly anything it's asked to do. It's also a great-looking truck, with lots of chrome and detail to make it stand out in a crowd.

Let's open the box to see how this monster goes together. I know, you've heard it before, but this time it's really, *really* important that you read the



Author's son, Josh, with the High Roller.



SUPER SCALE SPLASHIN', MASHIN' AND THRASHIN'!

instructions *before* you start building this kit. The instruction manual is *thick*, but the diagrams are generally good, and the steps are fairly clear and easy to understand. If you take your time, the manual should be easy to follow.

In my kit, there was a little blue sheet giving corrections to the instruction manual. Pay careful attention

to these changes, because you could have hours and hours of frustration if you choose to ignore them. So take the time to read everything before you begin, and save yourself some headaches. MRP helpfully highlighted all the changes in the instruction manual, so I knew where to pay close attention to the blue sheet. This highlighting was a great idea, and it ought to be done by *every* kit manufacturer whenever there's a change in a kit.

As we all know, reading a bunch of "tab-B-in-slot-A" stuff is about as boring as watching batteries discharge, so I'll just run through a few items of interest as I encountered them during construction. These notes might just make your High Roller run better and faster.

ASSEMBLY: To begin, you'll need two sizes of Phillips screwdrivers (No. 0 and No. 1), needle-nose pliers, standard pliers, an X-Acto knife and 1/4-inch and 3/8-inch nut drivers. Have some silicone bathtub caulk for sealing parts, and thread-locking compound is also absolutely necessary.

The diffs in my kit were already assembled, but I took them apart and added some silicone to seal the housings. This is a really good idea, since the hardened steel used in the diffs is extremely strong, but it's also extremely quick to rust. While the diffs were open, I noticed that the setscrews holding the output shafts were loose, so be sure to check yours.

HIGH ROLLER

MRP



HIGH ROLLER

Type Off-road Monster Truck
Scale 1/10
Sug. Retail Price \$379.95

DIMENSIONS:

Overall Length 18 1/4 inches
Width 13 3/4 inches
Height 13 inches
Wheelbase 10 3/4 inches
Front Track 9 3/4 inches
Rear Track 9 3/4 inches

WEIGHT:

Gross (w/bat.) 8 pounds, 6 ounces
Balance (f/r) 50/50

BODY:

Type Ford F-150 pickup
Material Lexan

CHASSIS:

Type Bathtub
Material ABS plastic

DRIVE TRAIN:

Type (prim./sec.) Bevel gear/shaft
Differential Adj. ball/adj. ball
Bearing Type Ball bearing

SUSPENSION:

Type (f/r) Independent upper and lower A-arm
Dampening (f/r) Coil spring/Coil spring

TIRES:

Front: Type Terra
Dimensions(DxW) 3 3/8x5 7/8 in.
Rear: Type Terra
Dimensions(DxW) 3 3/8x5 7/8 in.

ELECTRICAL:

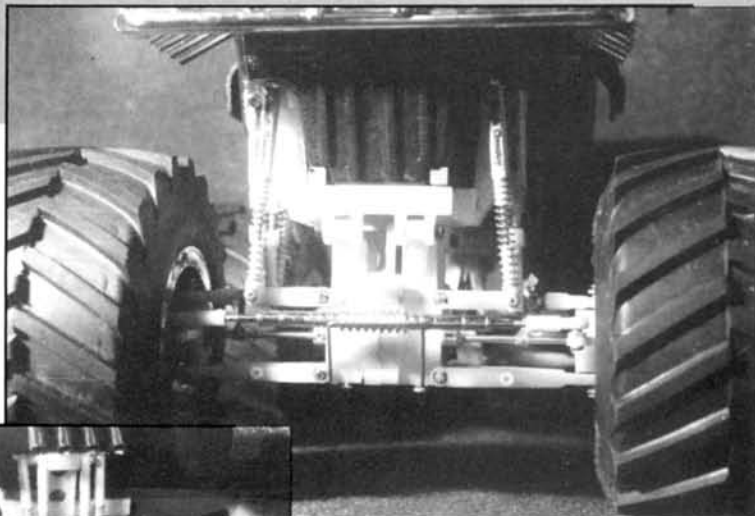
Motor High-performance 540
Speed Controller Variable resistor, forward-and-reverse
Battery Type Required 6-cell flat, 7.2V, 1,200mAh

OPTIONS AS TESTED:

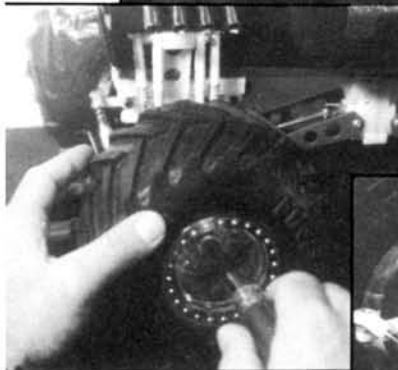
Aristo-Craft Challenger 4000 4-channel radio.

COMMENTS:

The truck is easy to assemble, if you follow the instructions carefully. The stock gearbox won't hold up to a high-powered motor or 7-cell battery pack, as is. For high performance, add ball bearings to the gearbox or be sorry! The High Roller is slower than all other R/C monster trucks, and needs to be made faster.

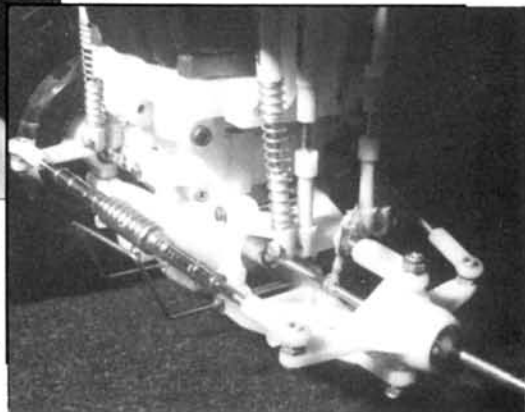


Head-on view has impressive scale appearance. Note: dummy steering damper molded into tie-rod.



Right: High Roller front suspension features upper and lower A-arms with adjustable camber, plus four shocks and dual springs. Note: dogbone saver (see text).

Above: Reversing the direction of the treads turns the High Roller into a real swimmer.

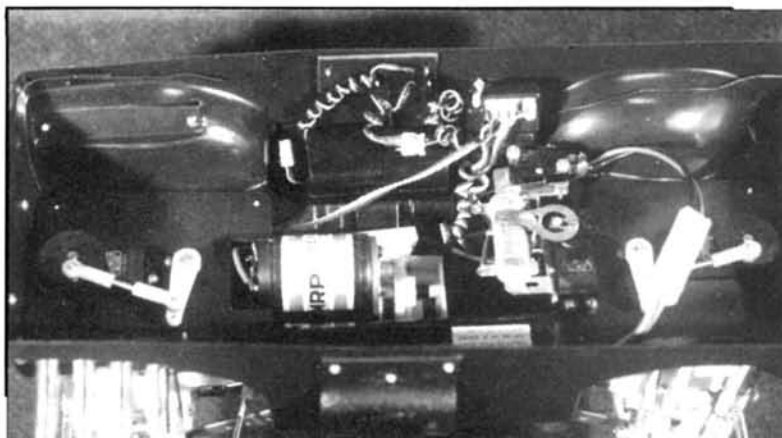


(Thread-lock is always very good insurance.)

While you're assembling the kit, to help start the screws, taper the holes in the nylon parts. This makes it much easier to start machine screws. I used my X-Acto knife with its trusty ol' No. 11 blade, and I had no trouble starting any of the machine screws or tie-rods.

As you assemble the front and rear suspensions, be sure to keep each assembly separate; they use the same pieces, but are reversed when assembled. I didn't pay any attention to this, and spent quite some time disassembling and reassembling!

(Continued on page 120)



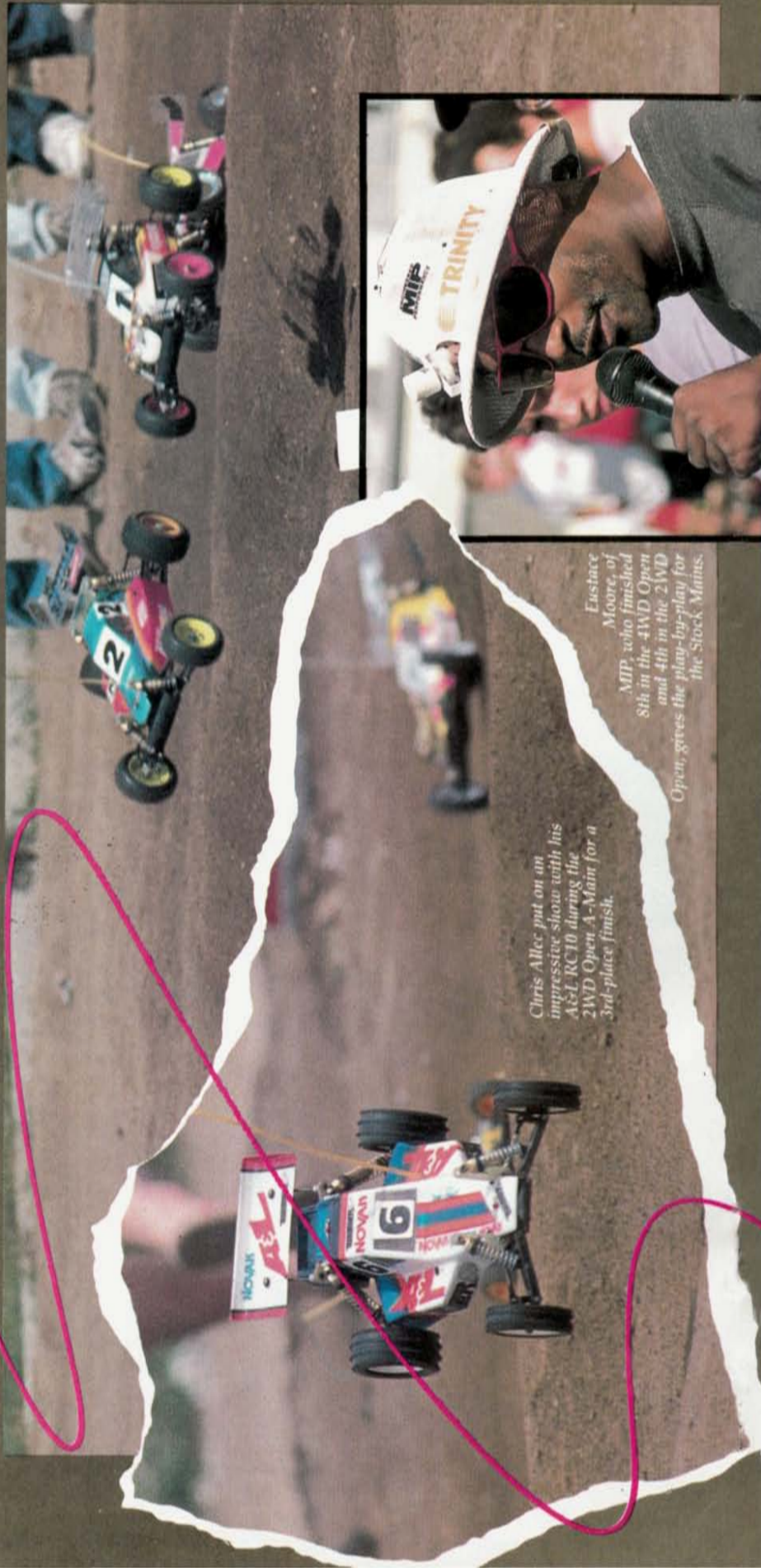
Bathtub-style chassis comes in handy, especially when afloat. Note: four-wheel steering uses two servos.

FIRST ANNUAL

by STEVE POND

DIRT SHOOTOUT

SPONSORED BY CAR ACTION AND TRINITY



Chris Allec put on an impressive show with his A&L RC10 during the 2WD Open A-Main for a 3rd-place finish.

Eustace Moore, of MIP, who finished 8th in the 4WD Open and 4th in the 2WD Open, gives the play-by-play for The Stock Mains.

THE BIG GUNS LET IT FLY

SINCE 1985, TRINITY, one of the leading motor manufacturers, has sponsored an annual Shootout, which brings the best together to do battle. Until now, races have been run on asphalt and carpet

tracks, and the competitors ran 1/12-scale on-road cars to determine who would take home the bragging rights as the top gun. This year marked the First Annual 1/10-scale Dirt Shoot-

out, and it was sponsored by Car Action and Trinity. Not only did this event attract some of the best off-road racers in the country, but it also served as a testing ground for some of the latest high-performance cars and accessories.

The First Annual Dirt Shootout was held at the R & R Hobbies Raceway in Quincy, IL. This facility has a lot to offer R/C enthusiasts, including an indoor carpet on-road track as well as an indoor off-road track. There's also a shop fully stocked with all the accessories and break-easy items needed for almost all competitive on-road and off-road cars. R & R's outside off-road track was the site of the Shootout.

The drought that plagued the

Midwest during most of the summer had taken its toll on the R & R track, which had a dry, hard surface that required constant attention to be raceworthy. Despite the

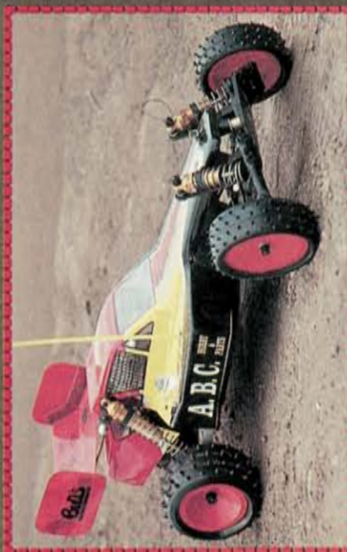
efforts of the maintenance crew and the racers, track conditions varied from dry dust bowl to Mississippi mud. Despite the adverse conditions, the racers—invitational and amateur alike—were up to the challenge.



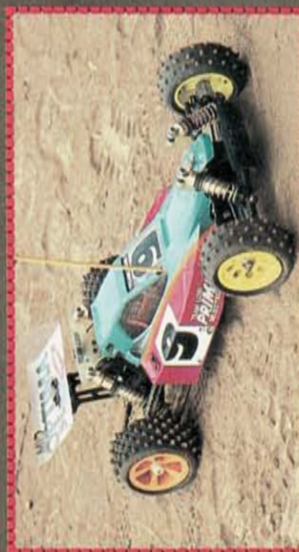
This tire-to-tire line-up for the 4WD Open practice A-Main made for a very interesting start. At the far left is the Final winner, Jim Dieter, and next to him, Kyle Reed, who took 3rd in 4WD Open and 1st in 2WD Stock.



Racing in box-stock form, the new JX2 from Ranch Pit Shop took 5th in the Open A-Main and 1st, 6th and 10th in the Stock A-Main.



Rob "Hollywood" DeSanti from ABC Hobbies in Brooklyn, NY, won Concours with his beautifully detailed RC10.



Jack Johnson's Turbo Optima Mid with the Losi Link rear suspension of the JX2 was the second-fastest qualifier and finished 4th and 6th in the Open and Stock classes, respectively.

FIRST ANNUAL DIRT SHOOTOUT



The contrasting driving styles of Jim Dieter, Joel Johnson and Gil Losi Jr.—almost looks as though they're fishing! Johnson is winding up to toss in a fat worm with his new pistol-grip Cast Master.

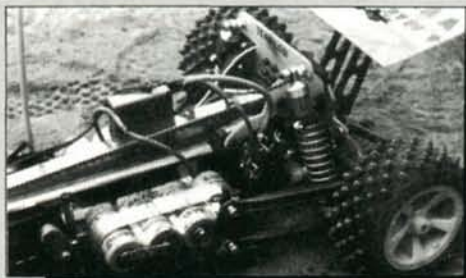
With a day of practice to allow them to dial-in their cars to the changing conditions, the drivers worked as fast as the hot and humid conditions would allow, in an effort to determine which combinations worked best. If you were caught with your car set for a dry track and the track had just been groomed, the result was enough traction to flip a Panzer tank and certainly enough to relegate you to the slums of dump

city, limping into the pits far shy of the four-minute mark. For both the 2WD and 4WD classes, the tire of choice seemed to be the Schumacher Cat tire. Traction with these tires was as good as could be expected on a dry track, and on a damp track, by precisely manipulating the controls, most made it around without too much inverted flight. With a good day of practice under their belts, the racers headed

HOT STUFF

MANY MANUFACTURERS use national races as proving grounds for their latest cars and accessories. It allows them to accurately test products, and this results in a better product for the consumer. The Car Action/ Trinity Shootout was no exception to this.

Jack Johnson, racing for Ranch Pit Shop, not only successfully ran the new JrX2, but a conversion was also adapted to Johnson's Optima Mid using the JrX2 rear



Jack Johnson's Turbo Optima Mid SE featured a prototype conversion for the Losi Link rear suspension from the JrX2. They tell us that if further testing proves as successful, they'll produce the kit.



The simple design of the Pro Mid Radiant proved to be very effective at the Shootout, with very fast lap times and good stability.

suspension. By using fiberglass plates and a plate chassis to accommodate the pivots for the radius rods, the JrX2 rear suspension and universal joint swingshafts can be used on the Mid. This was the first time the car had been run, and it was reasonably successful. Although, at the time, it wasn't clear if this would be offered as a conversion kit, the RPS team indicated that if the conversion proved effective during further tests, it might be kitted.

Eustace Moore of MIP used a new 4WD conversion for the RC10 that's very similar to the MIP original, but has a belt drive to replace the old chain drive. According to Moore, the new belt drive is a more

home with a reasonable idea of what to expect for the next two days of qualifying.

Conditions during qualifying were like those at practice but, having had a taste of what the track conditions promised, the drivers only had to keep an eye on the water hose. During the two-day event, there were four rounds of qualifying for each class, starting with the 2WD Open Class. Fighting mechanical troubles and all the other mishaps that can occur during an off-road race, the racers continued to play with gear, tire, motor and battery combinations during each round of qualifying. Taking TQ in the 2WD Open Class was Joel Johnson, driving a Trinity-powered Ultima. During the first qualifying round, mechanical troubles sidelined his Ultima with 14 laps on the clicker and a not too promising DNF. Round two saw a 17-lap run by Joel, and he beat this by two seconds in the fourth. The clincher came in the third round when Johnson went for broke and never looked back. Rounding the final turn as the clock closed in on four minutes, Johnson just nipped the line before the clock expired, giving him an unequalled 18 laps in 4:14.4.

As the 4WD Open A-Main was molded into shape, Gil Losi Jr., sporting a Revolution-powered Turbo Optima Mid SE, seemed to dominate. During round one of qualifying, Losi Jr.

came home with the checkered flag with 18 laps and a time of 4:10.7. During the next two rounds, James Dieter, Mike Giem and teammate Jack Johnson chiseled away at Losi's first-round TQ mark and forced him to turn in a command performance in the final round if he was to retain the number-one spot on the grid. Rising to the occasion, and taking a chance by running Primetime SCRs instead of the standard SCE 1700s, Losi blistered the track with another 18-lap run a full five seconds faster than the first round for TQ.

Jack Johnson also put on his drivin' shoes to take home 2nd place on the starting grid for the A-Main. Johnson drove an Optima Mid prototype that featured the front end of the Optima Mid and the rear suspension of the JrX2! Also turning in impressive performances were Jim Dieter and Mike Giem driving Schumacher Cats for Team Trinity. During the final round of qualifying, the restless Giem,



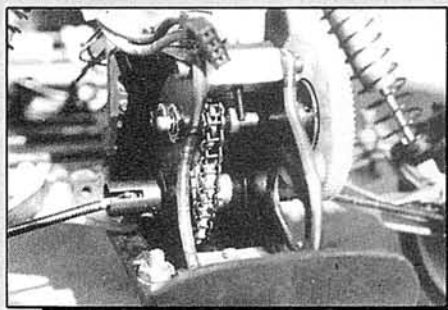
Rob DeSanti of ABC Hobbies is shown here posin' with his Concours-winning car and trophy.

efficient drive system, partly because the belt won't stretch like a chain system. (This stretching causes a difference in pitch between the sprocket and the chain.)

The Pro Mid Radiant, a new 4WD car from AYK, was run at the Shootout by Mike and Steve Dunn of Race Prep. Although luck wasn't on their side, the Mid Radiant turned lap times as fast or faster than many of the A-Main qualifiers. The Pro Mid Radiant resembles the current Radiant, but it has a new mid-motor



The new, 4WD, RC10 belt conversion from MIP is shown here aboard Eustace Moore's car. According to Eustace, this drive system is far more efficient than the previous chain setup because of the limited stretch in the belt.



This prototype of the ABC Hobbies Ultima chain-drive system proved to be very effective.

mounting position. An innovative addition to the Pro Mid is a set of one-way front hubs to be used in conjunction with the front diff to give the best possible traction and to reduce the push that's inherent in most 4WD vehicles.

ABC Hobbies' chain-drive diff for the Ultima was also tested at the Shootout. This setup features a diff very much like the one found in the Dominator oval car; on the bottom, it's connected to a jack shaft by means of a short chain. Although this drive hasn't had much of a chance to prove itself, similar systems have been successfully used in the past.

FIRST ANNUAL DIRT SHOOTOUT

who was probably affected by the heat, thought he'd cement his victory with a heads-up prank with Steve Dunn in the crosshairs. As Dunn concentrated on his car as it went around the track, Giem snuck around to the front of the drivers' stand and, holding a full bottle of Zap CA, he parked himself in front of Dunn. After dousing the edge of Dunn's shoes with the CA, he liberally coated the glue with Zip Kicker. Needless to say, Dunn looked surprised when he found that his feet were one with the drivers' stand!

The Stock Classes were next to qualify, and with each of the cars using a Trinity Monster Horsepower stock-class motor, the racing was as close and exciting as it could be. In the 2WD Class, Losi demonstrated his driving prowess once again by setting the pace at 16 laps in four minutes flat. Losi and the rest of the RPS team ran the new JrX2, which will be on the hobby-shop shelves, in stock configuration, as you read this. While the X2 showed a slight tendency to come down nose-first over the jumps, the rest of its performance was flawless, with three of the five at the race qualifying in 1st, 2nd and 4th places in the A-Main. Losi took the 2WD stock TQ in the same way as he'd captured the

4WD honors. Coming back in the fourth round, he beat his first time by more than half a lap with a final of 17 in 4:08.0.

The Four-Wheel stockers finished the qualifying. Setting the pace in this class was Jim Dieter driving a Schumacher Cat for Trinity. Only in the fourth round was Dieter able to get TQ, with a time of 4:02.9 for 18 laps.

The second day began with a Concours contest where racers showed off their gleaming machines. Taking home the top honors was Rob "Hollywood" DeSanti from ABC Hobbies in Brooklyn, NY. Rob's RC10 featured the new ABC Hobbies RC10 body with Associated's new RC10 aerodynamic wheels and a brilliant paint job.

The 2WD Open Class was the first to run, starting with the lower Mains and working up to the A. The line-up in the A-Main started with Joel Johnson driving a Trinity-powered Ultima. In the second slot was Joe Schmitz, also driving an Ultima with Twister power, and Giem started third with a Trinity-powered Ultima.

(Continued on page 130)

4WD OPEN

Starting Position	Finish	Driver	Car	Motor	Battery	Speed Controller	Charger
3	1	James Dieter	Cat XLS	Trinity	Trinity SCE	Novak	Turbocharger
10	2	Ron Rossetti	Turbo Optima Mid	Revolution	Team Losi SCE	Novak	Novak
6	3	Kyle Reed	Cat XLS	Trinity	Trinity SCE	Novak	Novak
2	4	Jack Johnson	Mid SE w/Losi Links	Revolution	Team Losi SCE	Novak	Novak
1	5	Gil Losi Jr.	Turbo Optima Mid	Revolution	Team Losi SCR	Novak	Novak

2WD OPEN

Starting Position	Finish	Driver	Car	Motor	Battery	Speed Controller	Charger
2	1	Joe Schmitz	Ultima	Twister	SRS SCE	Tekin	Novak
1	2	Joel Johnson	Ultima	Trinity	Trinity SCE	Novak	Turbocharger
6	3	Chris Allec	A&L RC10	Twister	Sanyo SCE	Novak	Novak
5	4	Eustace Moore	MIP RC10	Trinity	Trinity SCR	Novak	Novak
10	5	Ron Rossetti	JRX2	Revolution	Team Losi SCE	Novak	Novak

4WD STOCK

Starting Position	Finish	Driver	Car	Motor	Battery	Speed Controller	Charger
5	1	Ron Rossetti	Turbo Optima Mid	Trinity	Team Losi SCR	Novak	Novak
7	2	Mike Giem	Cat XLS	Trinity	Trinity SCR	Novak	Turbocharger
4	3	Greg Brown	Cat XLS	Trinity	Simply Awesome SCR	Novak	Accucharger
10	4	Steve Dunn	Pro Radiant	Trinity	Sanyo SCR	Novak	Novak
9	5	Gil Losi Jr.	Turbo Optima Mid	Trinity	Team Losi SCR	Novak	Novak

2WD STOCK

Starting Position	Finish	Driver	Car	Motor	Battery	Speed Controller	Charger
4	1	Kyle Reed	JRX2	Trinity	Trinity SCR	Novak	Novak
3	2	Chris Allec	A&L RC10	Trinity	Sanyo SCR	Novak	Novak
10	3	Rick Velhow	Ultima	Trinity	Trinity SCR	Novak	Turbocharger
5	4	Don Jones	Ultima	Trinity	Sanyo SCR	Novak	Turbocharger
9	5	Mike Ebert	RC10	Trinity	Advantage SCR	Novak	Novak

LETTERS

(Continued from page 14)

Production Class—An Idea Whose Time Has Come

I'm 14 years old and a proud owner of an MRC/Tamiya Boomerang. The March issue of *RCCA* is one of the best I've bought. My favorite feature is the MRC race-day series. I think this is a good idea. I race at an oval track. There are only two rules: The car must use 6-cell batteries and weigh at least 3½ pounds. This track is dominated by adults who have \$1,000 invested in their cars. I have a stock motor and ball bearings. Tell me I won't get blown away! I've decided to try to make a "Special" for kids on Sunday, where the car has to be stock, but you can have a hopped-up stock motor (such as Trinity, Revolution, Revtech stock) and ball bearings!

I want to thank Steve Pond and Rich Hemstreet for their suggestions!

DREW CALLARD
Easton, PA

P.S. I'm glad the RC10 won the Shootout in the April issue.

Drew, your point has been addressed before, but it's one that can't be stressed enough, especially now. If any of you young racers out there have the same gripe, please write. We need to let the industry know how you feel. And, dear industry, take note of what Drew is saying. Something has to be done; what are you prepared to do?

CC ■

BUDGET RACER

(Continued from page 20)

section. (See photo.) I installed it that way, and, with the additional downforce at the rear of the car, picked up some more high-speed stability and a better "flight angle" off the jumps.

Incidentally, the track on which we did the tests has a high-speed, large, dirt oval around the outside. About half of this oval is used for the off-road course, so I was able to check the Falcon out in a high-speed, banked turn and a long straight turn at the end. This final turn is difficult to get around without smacking the wooden outside wall.

As you can see, suspension "tune-up" takes a little work and thought; there's no "cookbook" for suspension changes. However, you can make the job easier if you remember to *change only one thing at a time* between tests, and write down what you do in each step, so you'll be able to go back to a better setting if you head off in the wrong direction.

Get into the habit of trying new things to see if they work on your car. Sometimes, I make changes that don't do what I think they should, but the only real mistake is not trying.

In addition to the suspension work, the following changes were made:

The Falcon body doesn't fit closely to the chassis tub, so a lot of dirt gets up inside the car. I corrected this by using short screws that secure the body pods to the chassis tub. (See photo.) The car stays cleaner, so it will run longer. Be sure the screws are short, or they could dig a hole in your battery pack. (You could also use tape or Velcro.) The screws are a bit of a nuisance, but they work.

I installed a foam dust cover on the motor. The right tire tends to kick lots of dirt right into the cooling slots of the stock motor. Be sure to clean your dust cover before *every* race day, and on a really

(Continued on page 53)



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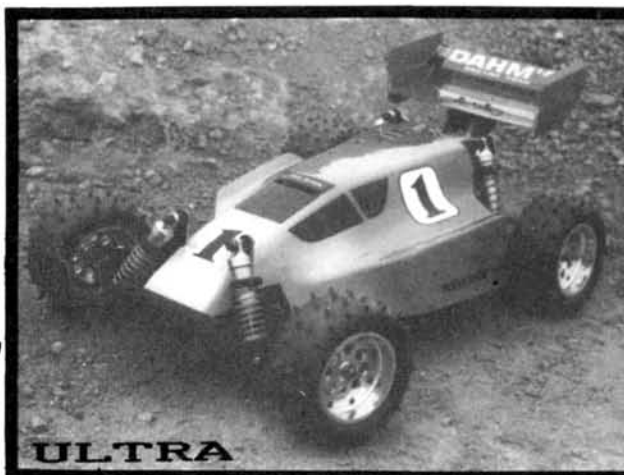
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BUDGET RACER

(Continued from page 50)

dusty track, it's probably best to clean it before every race.

I used one of Parma's* heat sinks to keep the motor cooler and help it live longer. These are good-quality heat sinks that will work on most motors.

Tests now showed the car was working pretty well. I took it to the local track where K-RON'S Hobbies sponsors races, and I asked Kevin Kranjack, who drives a Kyosho* Optima Mid, to drive the Falcon in a heat race so I could shoot the pictures. Even though this was the first time he'd ever seen the car, he managed to hold off an RC10 for about two-thirds of the race, and he finished second. True, one heat race does not a series make, but we were impressed with the way the Falcon handles.

Through all this testing and the heat race, there were no parts failures; even when it whacked into the boards, nothing broke. So what's next? First, I'll disassemble the diff to check for wear patterns and to re-lube it with gear lube. (I wish Tamiya included a little more gear lube in its kits.) Then I'll explore rear tire changes to find out what fits and what works best on various track conditions. After that, I'll take a look at gear ratios other than the 18- and 19-tooth pinions provided by Tamiya.

This car needs brakes, so I'll assess the possibility of fitting a wire-wound speed controller in place of the stock unit. Sure, you could use an electronic speed controller, but this is a "Budget Racer."

I'm experimenting with a process for winding springs for the Falcon, and I hope to have some news on this in the next "Budget Racer." How about a stabilizer bar and a setup for oval tracking? Stay tuned. We'll get to all of it!

See you at the track.

*Here are the addresses of the companies mentioned in this article:

Tamiya/MRC, 2500 Woodbridge Ave., Edison, NJ 08817.

Trinity, 1901 E. Linden Ave. # 20, Linden, NJ 07036.

Aerotrend, 31 Nichols St., Ansonia, CT 06401.

MRP, 18676-142 Ave. NE, Woodinville, WA 98072.

Pacer Technology, 1600 Dell Ave., Campbell, CA 95008.

Parma International Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

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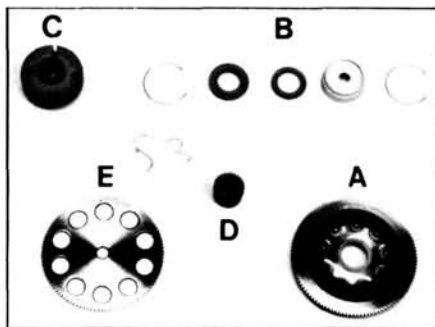
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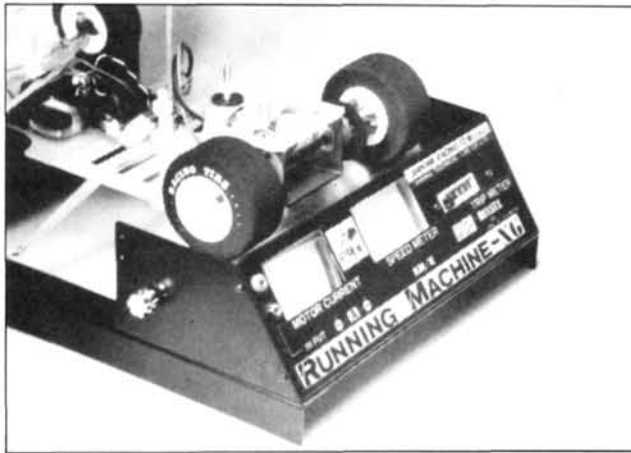
HIGH SPEEDS ON THE WORK BENCH

by RICH HEMSTREET

ASR/C CAR RACING continues to grow, new products are constantly showing up. Some of these new items meet obvious needs, while others are of questionable value. The Shinwa* Running Machine is designed to let you test your race car on your workbench, rather than having to take it to a test track. A test-stand approach is very good, because it offers controlled, repeatable conditions. While static testing doesn't give you any information about suspension settings or aerodynamic forces, it can provide motor/gear/tire size/battery combinations that can be applied when you reach the track.

The Running Machine has a roller for the car's rear wheels to ride on. A "speedometer" is connected to the roller, along with a re-settable "odometer." The stand also has a built-in analog ammeter. Obviously, as you pull the

trigger, your car goes faster, and the Shinwa stand should show you how fast your car is going. Unfortunately, this presents a couple of problems for the Running Stand. First, the "speedometer" supposedly has dual measurements.



It's your choice when the needle on the speedometer hits 30: It can mean either 30mph or 30kph. You might just as well say that it reads 30 times the speed of light, for all the good this nebulous unit of measurement does for you. Even more of a problem is that the meter only goes from 0 to 60

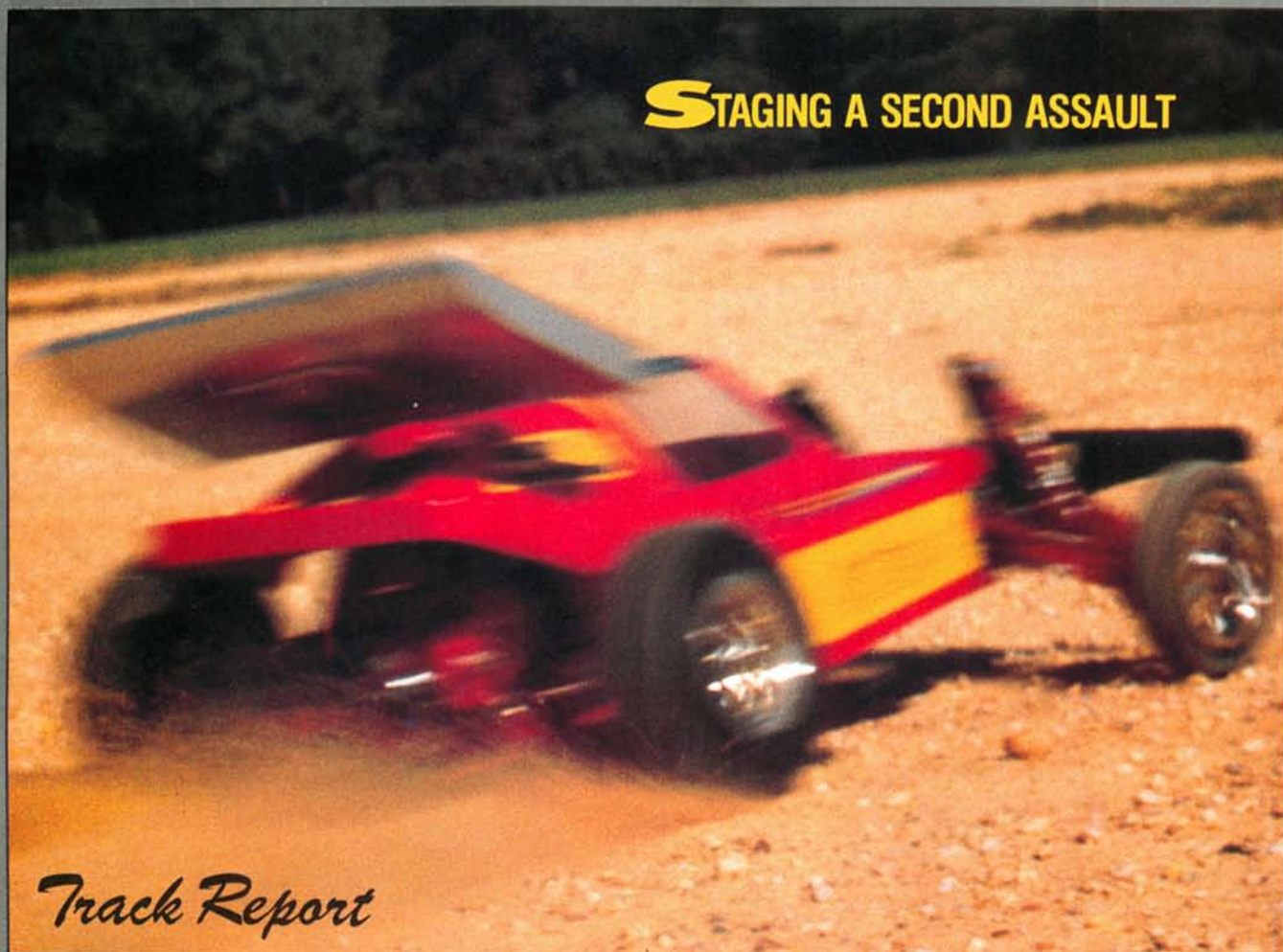
of measurement, and I was able to peg the needle at 60 while running a stock motor with a small pinion gear, a large spur gear and only a partially charged 6-cell pack. It sure doesn't take much to go way beyond the capabilities of the Running Machine's speedometer.

The Shinwa people need to abandon the idea of having a speedometer showing mph/kph and to attach a good-quality tachometer to the roller—a tach that has a sufficient rpm range. On the dial, a second hand that could be quickly placed to mark the maximum rpm would also be a valuable test tool. As it is, the Shinwa Running Machine's only practical use is for breaking in your drive train on the workbench. As a diagnostic tool, forget it!

**Here is the address of the manufacturer featured in this article:*

Shinwa; distributed by Andes Hobbies, P.O. Box 3077, Laguna Hills, CA 92654. ■

STAGING A SECOND ASSAULT



Track Report

MRP STAGE III



by JOE BRUNI

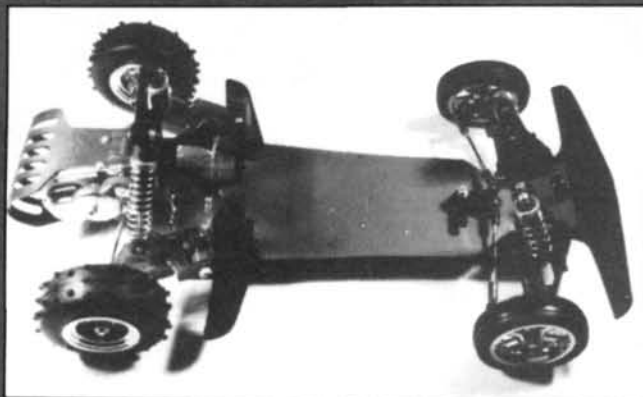
LET ME TELL YOU something about competitive off-road racing: Most national-caliber race machines are a composite of after-market parts that replace the stock items on an "out-of-the-box" version of a particular car. Whether the car is a 2WD or a 4WD model, it has so many additions (or, for that matter, subtractions) that it's difficult to pinpoint the car's exact heritage. Enter the consumer—you—who reads the race

results and goes out to buy that "champion" race car, confidently expecting the same type of performance. Right? Wrong! You'll probably need to go out and spend even *more* money to be competitive! Here's where MRP* (Model Racing Products) comes in. They've built a 2WD car that's competitive right out of the box, so eliminating the extra cost of after-market goods. They've made a 1/10-scale 2WD race machine that's appropriately named Stage II and is a composite of *all* the necessary race-proven components.

THE KIT: MRP offers three kit versions of the Stage II, each containing the basic car, i.e., full chassis and Lexan body. Two of the kits include ball bearings; one

a resistor speed control and motor but lacks bearings. I chose the kit without electrics for this report, so I could use *my* choice of a modified motor/electronic speed control combination.

As with all MRP products, the kit arrived neatly packed in a colorful box. There's a small, signed label inside every kit, stating that the kit has been personally inspected to ensure quality and completeness. An informative 16-page assembly manual includes exploded diagrams of the assembly steps, as well as an easy-to-read summary of each step and a detailed hardware legend of the kit's nuts, bolts and screws. This makes assembly much easier; to distinguish between the odd metric-size



MRP uses a single-plane chassis design, giving easy access to radio equipment.

of these includes a resistor-type speed controller and a stock motor, while the other lacks electrics and allows the installation of an electronic speed control and *any* motor. The third kit includes

screws, simply match the part in question to the life-size legend drawing. The kit also includes a variety of Allen wrenches required for assembly, but you'll

(Continued on page 59)

MRP STAGE II

Type 2WD Off-Road
Scale 1/10
Sug. Retail Price \$264.95

DIMENSIONS:

Overall Length 16 inches
Width 9 inches
Height 5 1/4 inches
Wheelbase 10 1/4 inches
Front Track 8 1/16 inches
Rear Track 8 1/4 inches

WEIGHT:

Gross (w/bat.) ... 55 ounces (3.4 pounds)

BODY:

Type Stage II
Material Lexan plastic

CHASSIS:

Type T-6 aluminum (blue anodized)
Material Aluminum

DRIVE TRAIN:

Type (prim./sec.) Differential drive
Differential Ball diff

SUSPENSION:

Front: Type A-arm
Dampening Coil-over shock; pressurized
Rear: Type Swing-arm
Dampening Coil-over shock; pressurized

WHEELS:

Front: Type Two-piece chrome-plated plastic
Dimensions(DxW) 2 3/4 x 3/4 in.
Rear: Type Two-piece chrome-plated plastic
Dimensions(DxW) 3 1/4 x 1 1/4 in.

Tires:

Front Rubber/ribbed
Rear Rubber/spiked

ELECTRICAL:

Motor Dymond Red No. 2 (not incl.)
Battery Type Required 6- or 7-cell
Speed Controller .. Resistor or electronics

OPTIONS AS TESTED:

DRP electronic speed controller, Dymond Red No. 2 motor, Pulsar EXP 2001 2-channel radio.

COMMENTS:

The MRP Stage II certainly has the right mix of features and simplicity to warrant scrutiny in the coming year. Only time will tell how race-worthy it is. It's very hard to mount electronic speed control without modifications (see text).

STAGE II

ADJUSTABLE SHOCK TOWER

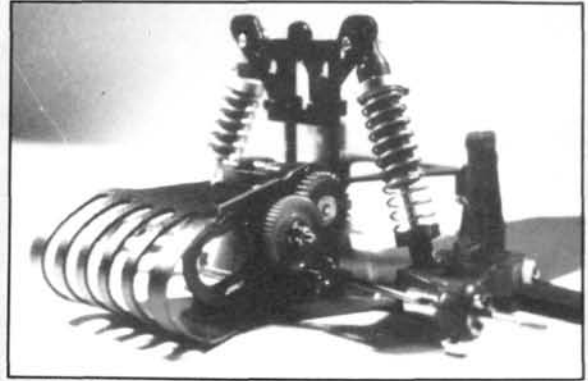
(Continued from page 57)

have to supply a needle-nose pliers, a Phillips screwdriver, an X-Acto knife and some good-quality thread-locking compound.

As already mentioned, most competitive off-road models require an assortment of after-market parts to gain that winning edge. The *stock* Stage II includes a majority of these parts. For example, the chassis is composed of super-light, anodized T-6 aircraft aluminum, which differs from standard aluminum as it's stronger and more flexible at a fraction of the weight. Coupled to the chassis is a four-wheel-independent-suspension group composed of super-tough nylon components controlled by four aluminum oil-filled, totally adjustable, pressurized shocks and fiberglass shock towers. The kit also includes a full set of precision ball bearings, a totally adjustable ball differential, nickel-plated axles and half-shafts, a durable, clear Lexan body, a fiberglass radio tray and durable front and rear Kydex bumpers.

Since this kit doesn't include a radio system or a battery pack, you have to provide your own. Any 2-channel car

MRP HAS JUST designed a unique rear shock tower for the Stage II that offers a wide range of shock-mounting positions. Besides providing three separate mounting holes for each shock, the tower's position can also be adjusted on the wing tubes. By moving the shock tower to a higher position on the tubes, you can lower the rear of the Stage II without affecting the shock or spring travel. If more ground clearance is needed, all you have to do is lower the shock tower. While it's true that these changes will have to be balanced



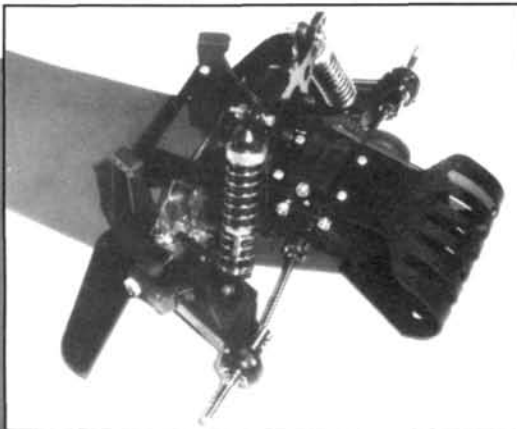
Height of the rear shock tower can be easily adjusted.

out with the front suspension for maximum performance, it's always nice to have another adjustment to get your car dialed-in. This is especially true when the rest of the competition can't make the changes you can! Now, if only MRP could come up with a similar setup on the *front* of the Stage II....

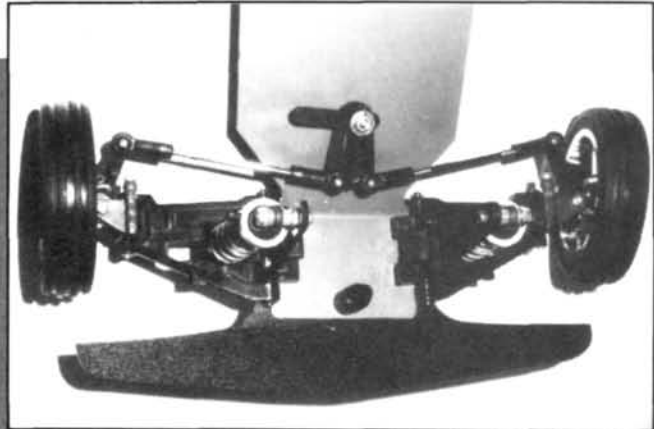
rear ball differential, and patience is required to achieve maximum performance from the diff system. Since the diff is easily accessible and totally adjustable even after construction is complete, don't

grease (included), as this will help to facilitate entrance of the balls into the diff hub and diff gear.

After completing the diff assembly, take both stub shafts, one in each hand,



Trailing arms used for the rear suspension on the Stage II. This effective system is an option on most other cars, but standard here.



A-arms are used for the front suspension; a good-size front bumper protects the suspension system.

radio and a 6- or 7-cell battery pack (flat or hump-back) will fit in the Stage II.

CONSTRUCTION: Construction took about six hours from box to track. Assembly begins with the construction of the

worry if you think you haven't tightened the diff screw to exact specs. Insertion of the 14 steel diff balls takes some concentration: Follow the instructions, and be sure to apply the proper amount of gear

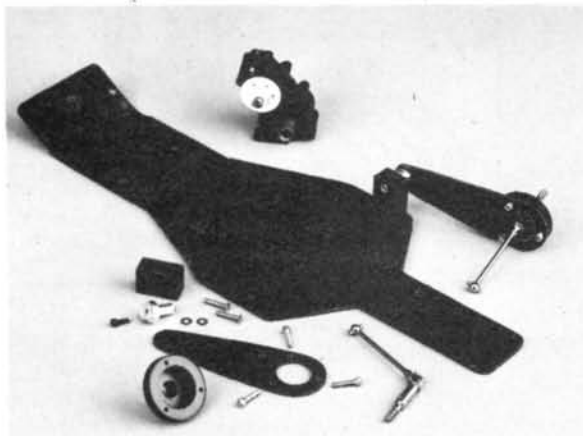
between your thumb and forefinger, and you should be able to turn each with *minimum* force. If they're too tight, loosen the diff screw; if it's loose, tighten it.

(Continued on page 60)

Bullet Racing Products



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STAGE II



(Continued from page 59)

The Stage II utilizes a four-shock system, and shock assembly deserves some mention here. The nylon shock piston comes unvented and it needs at least two ports for optimum performance. This venting can be accomplished easily by using the sharp tip of a new X-Acto knife and manually drilling out the holes in the piston. Two different shock springs are included in the kit: a progressive and a non-progressive set. The non-progressive set should be used on the front shocks to prevent chatter after jumps.

Internal and external gearbox assembly follows, and the only word of advice that I can give here is that you should pack the gearbox with diff grease. This will not only decrease the friction between the gears, but will also extend the life of the gears. The next steps encompass attaching the suspension systems and the drive-train systems to the chassis. The nylon is injection-molded, and this usually results in an excess of material (called "flash") that feathers at sharp corners or over holes. To achieve a proper range of motion of all the moving parts, cut off the excess flash with your X-Acto. Always try putting the pins or axles through their respective holes to ensure that they won't bind. If they do, take a drill and, choosing a size of drill bit just larger than the hole, re-drill the hole. This will markedly improve your performance, but be careful to avoid making the holes too large.

While mounting the rear gearbox to the chassis, you'll incorporate a Kydex bumper. This bumper is flat and must be bent when inserting it, thus causing it to have a spring-like characteristic; this is a nice touch, especially when you're in heavy race traffic. On contact, your competitors will simply bounce off!

(Continued on page 142)

INDIANA CHAMPS

(Continued from page 27)

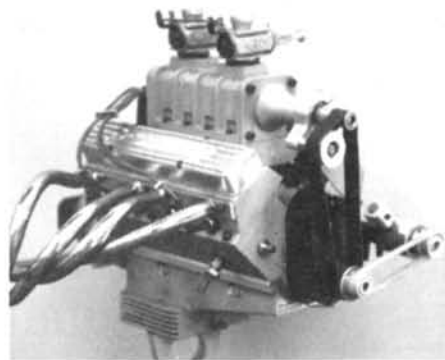
leading up to the final provided the large crowd of spectators with the day's most stirring race. Both Dayton racers made a shambles of the field: Lap after lap, Seybert led Piatt around the oval. They were seldom separated by more than two or three car lengths, and their lines through the corners were so precise that you would have thought the cars were on strings. Seybert got a break just three laps from the finish. He dove inside a back marker going into turn one, and he got away with it. Piatt couldn't get through until the back straight, and by then, Seybert was long gone—or was he? One lap from the finish, Seybert's batteries began to dump. Piatt quickly caught the leader and set sail, but to add to the drama, Piatt's batteries also began to go south. As the two crawled through the final three turns, Piatt edged out Seybert by just .2 second.

Although not as theatrical, the final in 1/10-Scale Modified lived up to its billing. Piatt was the class act of the field, winning by two laps and setting a lap record with 41 tours of the oval. The real

(Continued on page 88)

Conley V-8—Smallest V-8 Production Engine

The Conley "362" is the world's smallest production model V-8, and is now available in a rough casting kit. With the use of a Bridgeport Milling Machine and a lathe you will be able to machine the kit-provided material into a working V-8. Items included in the kit: castings (block, valve covers, pan heads, and intake), piston rings, water pump, timing belts and pulleys, camshaft lobes, injection-molded parts, wristpins, crank pins, 95% of the required metal, valve springs, screws, taper pins, dowel pins, Loctite, O-rings, and blueprints. The engine has a bore of .750 and a stroke of .625 which gives a total displacement of 36.2 cc or 2.2 ci and weighs approximately 5 lbs. It measures approximately 6" long, 4" wide, and 7 1/8" to the top of the carbs (when optional supercharger housing is used). There is an operating rpm from 2,000 to 12,000. Perfect for 1/4-scale cars and boats.



Total price, including shipping and insurance \$459.00

Optional items:

Supercharger Intake Manifold (nonfunctioning), including pulleys and belt \$49.95

Ball Bearings (11 required) \$108.00

Blueprints (Will be credited toward engine purchase; engine cannot be made from blueprints alone.) \$40.00

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TO DYE OR NOT TO DYE

Add strength...lose plain, lame, nylon color

by JOE BRUNI

A SA MEDICAL doctor, I daily appreciate the importance of *preventive* medicine, e.g., avoiding cigarette smoking to dramatically reduce the risk of lung cancer. Similarly, as a professional R/C car modeler and racer, by using "preventive medicine," I avoid premature wear, tear and breakage. I treat synthetic parts (specifically those of nylon and Delrin) to enable them to withstand tremendous forces.

To understand what you can do to improve the performance and durability of parts, let's review the process by which these components are manufactured. To begin, most of the parts on your R/C vehicle are man-made (or synthetic) products. Most are produced to meet certain standard levels of stress and heat. As you well know, whether you're a newcomer to this hobby or a pro, some of these parts won't withstand even the slightest force, and they break easily.

The most popular manufacturing method is a process called injection-molding. The material is heated to a liquid and then injected into a mold. As the liquid cools, it solidifies, and the part is easily removed from the mold. Nylon is

This MRP Stage II doesn't look like all the others. Note the red trailing arms that were once boring off-white.

Photos by Joe Bruni.



Select all the parts to be dyed and make sure molding flash is trimmed ahead of time.



Find an old pot that can hold all the parts and enough water to cover them.

injection-molded at extremely high pressures and temperatures. The problem with nylon is that when it cools, the outer surface of the part cools faster than the core, and this results in an inconsistency in strength throughout the part. When

subjected to intense forces (e.g., landing after a high jump), the part snaps at the point of strength difference. To avoid or reduce this risk, the parts must be *stress relieved*. According to the experts in the

(Continued on page 66)

TO DYE OR NOT TO DYE

(Continued from page 65)

nylon industry, stress relief can be accomplished by submerging your kit's nylon parts in boiling water for 30 to 40 minutes. This simple technique allows an even temperature throughout the part, and this *wasn't* accomplished during manufacturing. This process relieves stress. However, before attempting to perform this ritual, *make sure the part is made of either nylon or Delrin* or it will melt!

Coincidentally, while doing some research for this article, I discovered a useful fact. To improve penetration of the boiling water deep into the core of the nylon product, add a small amount of table salt before you submerge the parts. Now remember back to basic chemistry when you learned about osmosis—the diffusion of fluid through a semipermeable “barrier,” until there's an equal concentration of fluid on both sides. The salt added to the water creates a concentration difference and expedites the movement of the hot salt water (high concentration) into the core of the part (low concentration). But wait, there's more....

One day, while grocery shopping with my wife, I wandered off to buy light bulbs. Next to the light-bulb section was a display of fabric dyes, and when I glanced over at one of the boxes, I read “Contains salt (sodium chloride).” There were 10 colors available, and I chose red. I started with a front A-arm from one of my next projects, boiled some water, added the part and then slowly added some of the fabric dye to the water. Approximately 40 minutes later, I fished out the part—Eureka! A revelation! The part was a



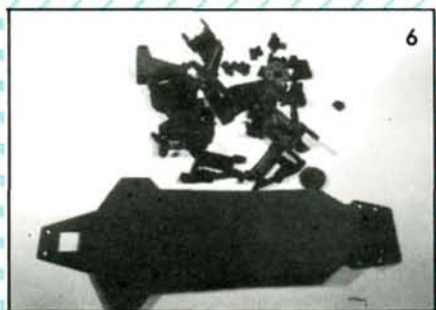
Fill pot with cold water and put it on the stove at a high temperature setting.



Tintex dye was used, but Rit will also work well. (Generally available.)



Add parts gently, and start to calculate time. Add dye slowly until desired shade is obtained. “Cook” for 40 minutes.



If you're unhappy with the color, it can be changed, but only to a darker shade. If you really want to go all-out, the aluminum parts, such as those on the chassis shown, can be anodized the same color or a complimentary color.

deep, rich red. Since the first experiment, I've dyed a lot of parts, trying a variety of colors and brands. I've found that one particular brand—TINTEX—has far superior color consistency. It comes in both a liquid and a powder and, not only can you improve the appearance of your model, but you can also prevent premature breakage.

For proper stress relief and/or dyeing, use the following steps:

- Remove all the nylon components from your kit and re-seal the parts bags to avoid displacing any other parts.
- Find an old pot that can hold all the parts and enough water to cover them.
- Bring the water to a boil, and then add the parts slowly, to prevent the hot water splashing. Note the time.

If you're going to dye the parts, add the dye slowly until the water is the desired shade, and then boil the parts for 40 minutes. If you only want to stress-relieve the parts, add 1 tablespoon of salt and boil the parts for 40 minutes.

After 40 minutes, pour out the boiling water and run cold water over the parts. If you're dyeing, run the water until the excess dye has run off; if you're just boiling, run the cold water until the parts are cool.

If you're unhappy with the color, you can always re-dye the parts, but only in a darker shade of the same color or black. That's all there is to it! Is there a cheaper way to increase durability? I doubt it. Just *be careful* with all that boiling water; remember what I said about *prevention*. ■

by ERIC GOLDSCHRAFE

SPRINT-CAR RACING on dirt or pavement is probably the world's most exciting form of automotive competition. The cars are stubby and compact, and the angular cowls hide mega-horsepower V-8 engines with enough torque to permit wheel-stands coming out of the corners—even on dirt. These machines have changed little through the decades, but they've become faster and safer. While fast enough in usual dress, the "Outlaw" configuration, which allows large airfoil wings on top, is the most awesome. These wings help to hold the car on the track when the drivers shove the pedal through the fire wall and pitch the cars sideways through the turns. The sprint-car leagues have their own set of heroes, and the Kinsers, Swindells and other standouts have awed thousands of devoted fans.

Radio-control sprint-car models have been around for a while, but mostly in the larger scales and powered with gas engines. Until now, most of the 1/10-scale electric-powered sprinters have been conversion kits for off-road cars and generally intended for dirt-trackin'. Parma*, however, has just introduced its kit for a pavement-type Outlaw Sprint Car. All you need is a radio and a couple of common tools, and, even if you're

a novice, in a few hours, you're off and running.

PARMA
PRO

PANTHER

S P R I N T C A R

The Panther Sprinter isn't typical of today's on-road cars, as the motor pod is bolted directly to the fiberglass chassis without any T-bar or other means of rear suspension. The chassis is considerably narrower than most, so it fits under the slender body. (There aren't any phoney bulges in the body to hide a generic chassis.)

ASSEMBLY: Thanks to the uncomplicated nature of the kit and the easy-to-follow instructions, parts assembly is quite simple and trouble-free. A beginner should have no trouble with this car. An easily adjustable bent-wire steering linkage hooks up to a pair of coil-sprung front blocks that are mounted to a fiberglass crosspiece. A set of wedges

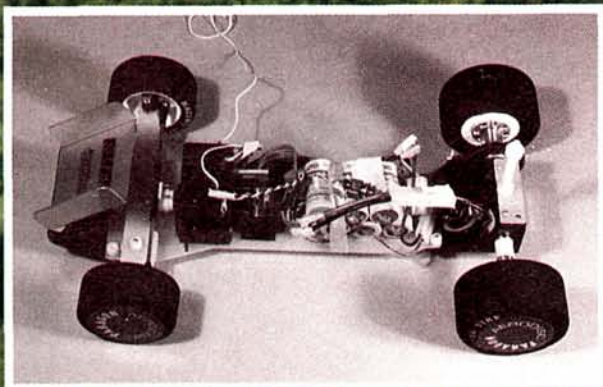
is supplied to set up the caster, although not much is needed on this car.

The rear pod is a strong, one-piece metal bracket that mounts the motor, axle, and rear body mount. A standard ball-type differential is included, and this goes together well and works smoothly on the graphite axle supplied in the kit. Parma recommends using ball bearings with this axle, although sintered bronze bushings are provided in the kit. This is my only real gripe; including the ball bearings would have added only a few more bucks to the price of the kit, and you wouldn't have to take the kit apart just to put them in. I had a pair that worked out, but these ball bearings are available from Parma.

Track Report



Quick to Build and Quick on the Track!



View of entire chassis setup, again showing crowded, but effective, layout.



Photos by Eric Goldschrafer.

There isn't much room to jockey the positions of things on the chassis, as the narrow body, with its low hood, doesn't give you much choice when positioning the electrical components. The kit-supplied matched Sanyo batteries are assembled with some wire braid, and I used a dab of silicone sealant between the cells to help hold them in the staggered double-row configuration. This pack nests into four cutouts in the rear chassis floor and there's just enough room for the servo-mounted speed control (provided) and the steering servo. The receiver found a home on top of the steering servo. A Tamiya* servo-saver hooked up the linkage to the servo, and the system was plugged in and checked out.

The body—a replica of the Challenger sprinter—was trimmed out and prepared for painting. The basic black was highlighted with amber pearl metallic trim, and the wing and lower body panels were painted silver. The wing assembly bolts directly to the molded-on roll-cage detail, and the smaller front wing bolts onto the front of the chassis. Some appropriate decals were added, along with the number, and the result is a pleasingly realistic race car.

Some preparation before using this car (and any car), will result in better performance over a longer period. After first being soaked in lacquer thinner, the

PARMA

PRO PANTHER SPRINT CAR

Type Outlaw sprint car/on-road
Scale 1/10
Sug. Retail Price \$180

DIMENSIONS:

Overall Length 16 inches
Width 8 1/4 inches
Height 8 1/4 inches
Wheelbase 10 1/4 inches
Front Track 7 1/4 inches
Rear Track 6 3/4 inches

WEIGHT:

Gross (w/bat.) 45 ounces
Balance (f/r) 45-55 percent

BODY:

Type Challenger Sprint Car
Material Polycarbonate (Lexan)

CHASSIS:

Type Pan
Material Epoxy fiberglass sheet

DRIVE TRAIN:

Type (prim./sec.) Metal pinion/Spur
 (plastic)
Differential Ball diff

SUSPENSION:

Front: Type Coil kingpin
Dampening None
Rear: Type None
Dampening None

WHEELS:

Front: Type Plastic
Dimensions (DxW) 1 3/4x1 in.
Rear: Type Plastic
Dimensions (DxW) 1 3/4x1 1/2 in.

TIRES:

Front: Type Foam slick
Rear: Type Foam slick

ELECTRICAL:

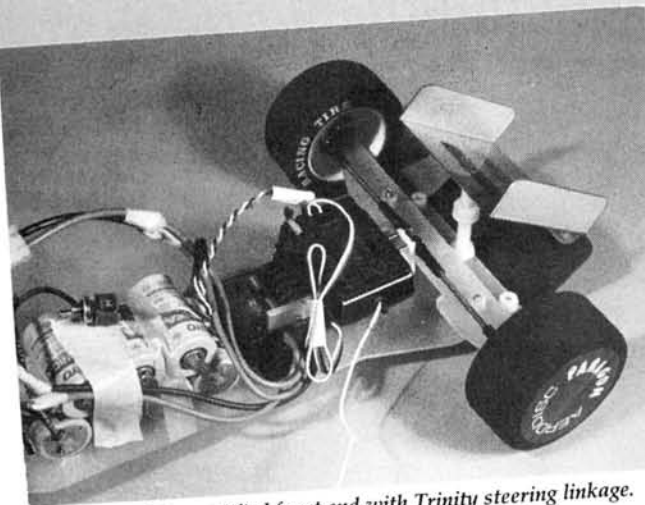
Motor Parma Yokomo stock
Speed Controller Mechanical
 wiper-type
Battery Type Required Supplied, 6
 Sanyo cells

OPTIONS AS TESTED:

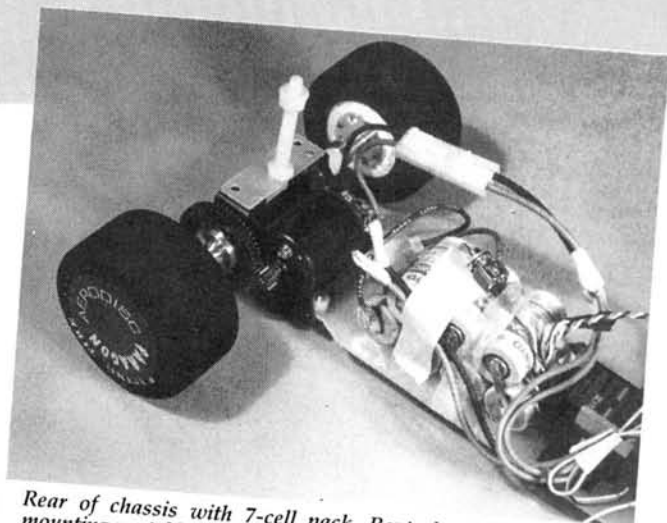
7 cells, Revtech modified, PDI Zeta.

COMMENTS:

Stock, it's a great entry-level car and easy to drive. Modified, it's a guided missile! It's too bad Parma didn't include a pair of rear ball bearings for the graphite axle to ride on.



The modified front end with Trinity steering linkage.



Rear of chassis with 7-cell pack, Revtech mill and BoLINK mounting post. Note there's no room left on the chassis!

bronze bushings on the front wheels were treated with Paragon's* Ultralon and then installed in the wheels. When used this way, this lubricant won't attract dust and dirt and, as a result, will do its job a lot longer before needing maintenance.

As built, the car is pretty fast, and it handled very well, due to the downforce and stabilization provided by the wing. (If you don't think it works, try running *without* it!) I decided to see just how radical I could be with this racer (after all, it is a *sprint* car), and I made a few simple changes. First, I bolted in a hot Revtech* modified motor (the Parma motor that comes with the kit runs well for a stock mill), and I also added a seventh cell to the battery pack. A PDI* Zeta speed control replaced the mechanical unit, and a Trinity* heavy-duty steering kit was installed. With all the downforce on the wing, the Parma body-mounting posts wouldn't stop flexing, so a set of BoLINK* posts were fitted. As no antenna was supplied, I installed a Pro-Line* antenna kit using the shelf over the rear axle as a mounting point.

I took the souped-up machine to Island Hobbies Raceway in Hauppauge, NY, for some hot laps, and the usual Wednesday-night stock-car crowd really paid attention when this beast hit the carpet! Even with a good dose of traction compound on the rear tires, the sponge slicks broke loose at the slightest provocation. I blasted around Island Raceway's 270-foot indoor carpet track in about half the time that it took most of the other cars, and it really *looked* a lot faster. The Pro Panther handles just like a real sprint car, too, as it's never really fully under control. It's "squirrely" in the corners and out of shape under power on the straightaways, but you grit your teeth, keep the trigger pressed into the palm of your hand and drive it out.

The wing does a good job; the faster you go, the better it works. You can usually drive out of any problem except a bad slide, and here, it's better just to lift, but only long enough for the Panther to straighten out a little. I did lose it once, and it slid into the retaining wall, bounced onto the top and barrel-rolled along the

edge, just like the full-size ones. There was no damage—not even to the wing! I can't wait for some competition! In the meantime, I want to try some wider back tires and wheels, like the lightweight parts available from Advance*. Maybe the beast will then pull wheelies going down the straights! Parma, you got your stuff together on this one!

**Here are the addresses of the companies mentioned in this article:*

Parma International, Inc., 13927 Progress Pkwy., N. Royalton, OH 44133.

MRC/Tamiya, 2500 Woodbridge Ave., Edison, NJ 08817.

Paragon Racing Products, 8802 Knollwood Dr., Eden Prairie, MN 55347.

Revtech R/C Products, 7401 White Lane, #19, Bakersfield, CA 93309.

PDI, 16922 N. E. 124th St., Redmond, WA 98052.

Trinity Products, Inc., 1901 E. Linden Ave., #20, Linden, NJ 07036.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

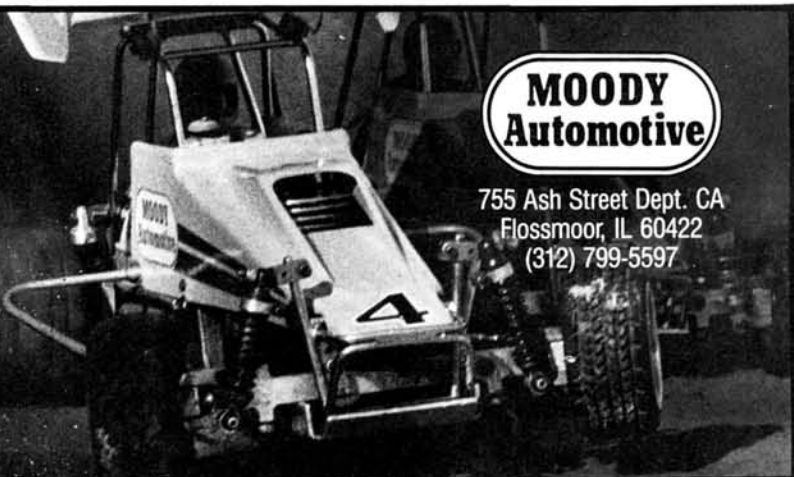
Pro-Line USA, P. O. Box 456, Beaumont, CA 92223.

Advance Eng. & Mfg. Co., P. O. Box 766, Woodland Park, CO 80866.

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Track Report

Lots of features and



PARMA PRO

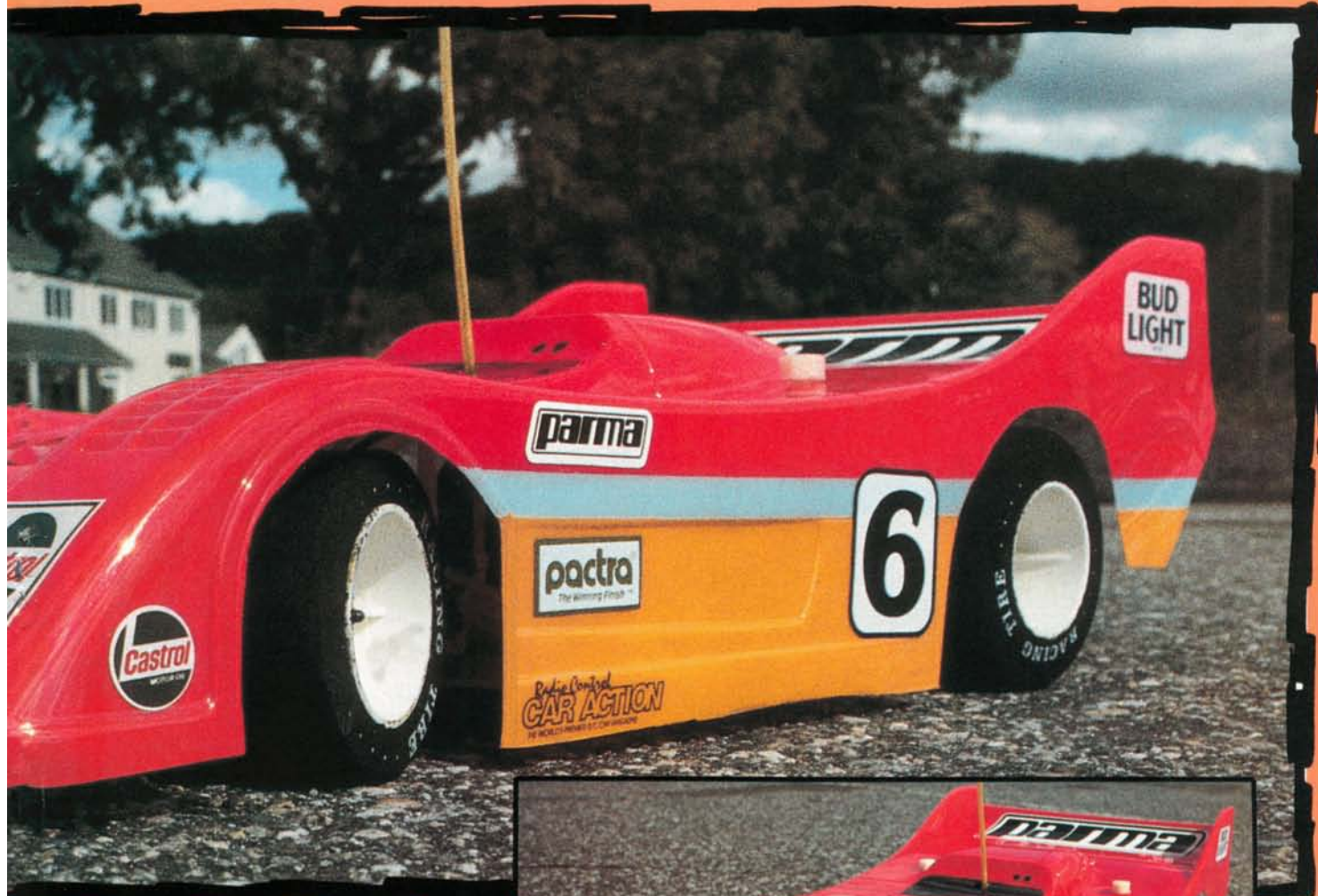
PANTHER 10

by RICH HEMSTREET

PARMA'S PRO PANTHER 10 made its debut at the First Annual Car Action Weekend. This 1/10-scale on-road racer did well in the Invitational Class, as both factory cars qualified for the A-Main and the Novak 600. Last summer, Andy Dobson made the A-Main at the ROAR 1/10-Scale On-Road Nationals with his factory ride. Parma now has the Pro Panther 10 in full production and it's available to everyone.

THE KIT: The Pro Panther is packaged in several ways. I chose the deluxe kit with the Osella Can-Am sports body; the same kit is available with either a stock-car body or a hot-rod body. Each of the deluxe kits includes six matched Sanyo cells, resistor speed control, Yokomo stock motor and a wiring kit, and one kit also

silky smooth Diff- One Potent Panther



Above: Parma's Pro Panther 10 is a competitive on-road racer.

Right: The slick Osella Can-Am body is included in the Sports version of the Pro Panther.



includes a radio. Twin rockerballs provide the rear suspension movement, and these give much better movement than from the T-bar flex alone. Up front, a coil spring is used above each steering block, as is the case with most 1/10-scale on-road cars. Bronze bushings are included for both the front and the rear of the car.

CONSTRUCTION: Although Parma's instructions are not very well-illustrated, the text is quite clear and the car isn't difficult to build. The front caster is controlled with sloping shims that mount between the fiberglass axle and the spacers. This is a nice system, because you have several caster angles (several different shims) that are precise and repeatable to choose from. (It's nice to

know exactly how your caster is set so you can always return to it.)

Be careful when you bolt the rockerballs into their nylon cases: These triangular pieces are *not* equilateral. Be sure all three holes line up before you screw them together through the T-bar. A Pro Diff with a graphite axle is standard on the Panther. Unfortunately, the graphite axle has to run inside bronze bushings instead of ball bearings. If possible, you should install ball bearings for the rear axle when building the car. For the small cost involved (compared to the Pro Diff), I think that Parma should have included the rear ball bearings in the kit. The differential is extremely smooth and

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PARMA

PRO PANTHER 10

Type On-road
Scale 1/10
Sug. Retail Price \$210

DIMENSIONS:

Overall Length 16 inches
Width 9.5 inches
Height 3.5 inches
Wheelbase 10.125 inches
Front Track 7.5 inches
Rear Track 7.125 inches

WEIGHT:

Gross (w/bat.) 43 ounces

BODY:

Type Osella
Material Polycarbonate

CHASSIS:

Type Single plane
Material Fiberglass

DRIVE TRAIN:

Type (prim./sec.) ... 32-pitch pinion/spur
Differential Ball-type Pro Diff

SUSPENSION:

Front: Type Individual coil springs
Dampening None

Rear: Type T-bar on two steel balls
Dampening Two coil springs

WHEELS:

Front: Type Nylon
Dimensions(DxW) 1.75x1

Rear: Type Nylon
Dimensions(DxW) 1.75x1.375

TIRES:

Front: Type Foam
Rear: Type Foam

ELECTRICAL:

Motor Parma Yokomo stock
Battery Type Required 6- or 7-cell
saddle pack

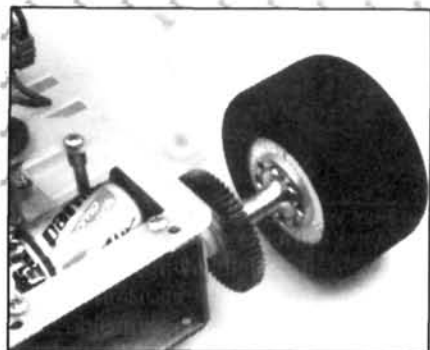
Speed Controller Wound rheostat

OPTIONS AS TESTED:

MC-9 Futaba speed controller.

COMMENTS:

Many well-designed features give the Pro Panther great potential. A poorly fitting wing tube and bronze bushings used with a graphite axle are a few areas Parma should address to improve this package.



Parma includes lightened aluminum hubs with the Pro Diff. This is a top notch setup for a standard kit.

works very well.

One other problem at the rear of the car is that the wing tubes don't fit because the screw heads that attach the dampener plate to the pod are too large. Otherwise, the car appears to be well-designed and manufactured.

PERFORMANCE: The Pro Panther really runs well. On pavement or carpet, it's not difficult to get the Panther hooked up. In the large field of competitive on-road machinery, the Panther doesn't have to take a back seat to anyone.

The stock Yokomo motor is peppy enough to make things interesting, and the chassis is capable of handling as much motor as you're able to drive. For top performance, the only changes needed are the addition of a full set of ball bearings, low-profile tires ("wagon wheels" are standard) and 48- or 64-pitch gears.

One final note: Many Pro Panthers are prone to do the "Parma skip," i.e., the rear of the car frequently skips or hops while going through a turn. While this is annoying to watch, it doesn't seem to hinder the car's performance. The probable cause of this problem is that the nylon axle mounts that bolt to the aluminum pod are too large. These mounts may flex enough under pressure to momentarily bind the axle, causing the tires to stop for a fraction of a second. If this is the problem, a more rigid axle mount would prevent it. Either way, Parma is ready to take on all comers with its Pro Panther 10 series.

**Here is the address of the manufacturer featured in this article:*

Parma International, Inc., 13927 Progress Parkway, North Royalton, OH 44133. ■

Troubleshooting

TROUBLESHOOTING PREVENTION

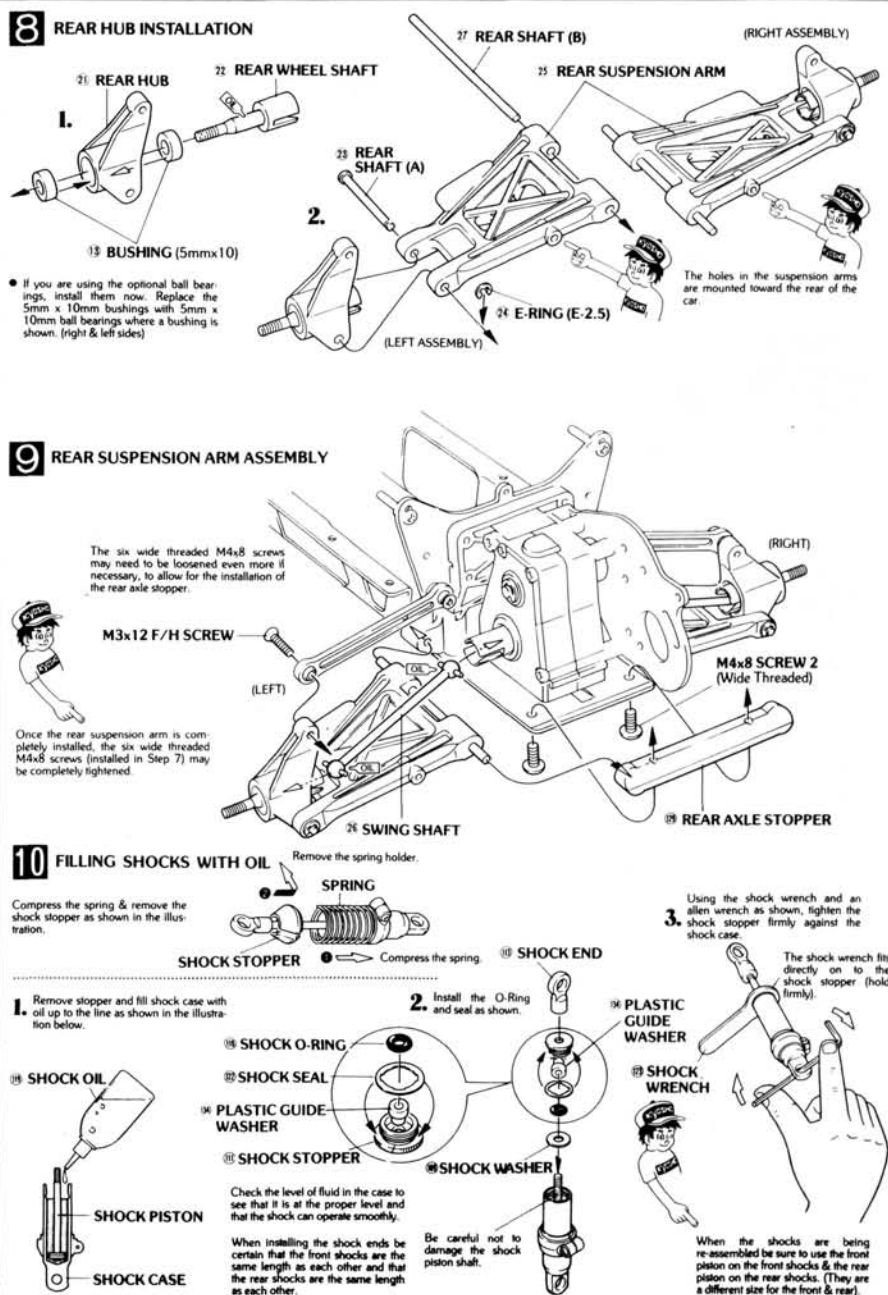
by FRED MURPHY

IF YOU FIND YOURSELF suddenly in the world of R/C car racing as a result of a holiday-season gift, here's some advice that many have heard before, but for you new people, here are some tips that could make your entry into R/C racing a permanent hobby.

First, for all those hot motors and parts you saw at the local track, go to the best source—the car owner who was using them—and ask more about them. Ask why he bought them, how they help the car's performance and if they were worth buying. Perhaps spending all that extra money, over and above the original car price, was a bad move, but in some cases, the person might not admit that, so ask as many racers as you can. As a first-time car owner, don't be led by everything you read, see and hear; have a reasonable budget as a basic starting point, don't get in over your head, and don't expect to be the hottest racer right away.

When you've spoken to the users of the products, make some logical observations yourself, because the most expensive equipment isn't necessarily the best buy at your particular stage of expertise. If you look closely at many of the hottest drivers and the cars they drive, you'll see that their equipment isn't as costly as that of many of their competitors. Why? Maybe it's their driving skills that make the difference and *not* the price of their equipment. Learn to drive what you have, and practice, practice, practice, *before* you lay out the big bucks. The best drivers could probably drive a box-stock car around any track and still be competitive. It's better to have your equipment improve to catch up with your driving ability, than to have your driving ability

(Continued on page 82)



Great effort and expense is put into making assembly manuals for you; make sure you read them carefully—including the fine print. Proper assembly often prevents future trouble.

TROUBLESHOOTING



Shop around before you take the plunge. Consult as many sources as possible, including the Car Action Buyer's Guide and the pros—the hobby dealers.

(Continued from page 80)

always trying to catch up with the capabilities of your equipment.

Before you dive in, consult the professionals; they're just waiting to tell you their stories and give you free advice. Talk to the local track owner and hobby-shop owner; they'll give you something that nobody else can—professional and personal service. The hobby-shop owner should be in business to make the R/C hobby, and your interest in it, last for a long time; check him out. By talking to him, you'll be able to tell if he's just after your money, or really wants to help. The hobby dealer can let you know first-hand what's hot in your area, and what you'll



find easy to build and repair. He can also help you make a wise decision, because if he doesn't, you won't be back. So use him; he probably wants your repeat business, and not just a one-time sale.

When you've made that all-important decision, take your time. I've said it in many of my columns over the years, but I can't stress it enough: Be patient, read *all* the instructions *before* starting the job, and be prepared to spend many hours *carefully* assembling your new car. Rushing to complete the job will result in errors that will have you taking apart components to start over. Do it carefully the first time; it takes less time than doing it twice. Manufacturers haven't gone to great expense in translating and illustrating instruction manuals so that you can ignore them. Read the manual and follow the procedures *in order*, because the research and development people are paid to make your job as easy as possible. Follow the instructions, and, if you get stuck, guess who'll be there to help?—the hobby-shop dealer, because his future depends on you.

When your project is complete, work on your driving skills, and the only way to do that is by *practicing*. Go slowly and learn slowly; in the long run, you'll be a lot better off. Visit the local track whenever



Above left: the Optima Mid; Above: the Lunch Box. Whether you choose ready-to-run or a kit car, make sure you don't get in over your head. Select a car that you can drive without taxing your skills too much, and you'll enjoy R/C for many years.

you can, and improve your driving skills there also, but even at the track, remember to start out slowly and increase speed as your skill level increases. No one will laugh at you if you drive slowly on the track, and, in most cases, you'll hear some very useful driving tips.

Another great advantage of learning to drive on a local track is that you'll be able to learn track etiquette. You'll need this knowledge to make your first racing experience a pleasant one. Be courteous to other drivers on the track and everyone will enjoy the spirit of competition. Your holiday gift will open up a whole new world of R/C racing fun.

So remember, shop around, look around, talk to the pros and take your time. The R/C hobby and sport is here to stay, and you can have a lifetime of enjoyment from it if you just use a small amount of forethought and common sense. Good luck, and happy motoring! ■

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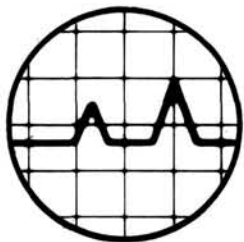
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SCOPING OUT



OUT




BY RUDY MEYER

Are manufacturers' claims fact or fiction?!

SCOPING OUT: As we're committed to bringing you the most up-to-date technical information on R/C products, Radio Control Car Action now has Rudy Meyer, an accomplished electrical engineer, to test the newest high-tech electronic equipment that's flooding the R/C market. "Scoping Out" is a two-part test in which a product is first subjected to extensive bench testing using sophisticated equipment and then actually used in the field. These tests will allow us to expose any ridiculous performance claims and, at the same time, provide R/C car enthusiasts with invaluable information on where they should put their money!

IF YOU'VE BEEN following these "Scoping Out" articles, you'll know that our lab has been extensively testing electronic speed controllers. Our objective is to determine whether or not the manufacturers' specifications (especially the current and voltage-drop ratings) in literature and data sheets are fact or fiction.

I'll explain a little about the fundamentals and elements of electronic circuits. Since we don't live in a perfect world, everything that has to do with electronics has resistance. Resistance is impedance to current flow. Here are the names and symbols of terms that will be used in this article:

-  = Battery (measured in volts)
-  = Resistor (measured in ohms)
-  = Motor

Three basic equations are used to

determine the voltage, current, and resistance of a circuit, and they're all forms of Ohm's (Ω) Law:

(A) V (voltage) = I (current) \times R (resistance)

(B) I (current) = V (voltage) \div R (resistance)

(C) R (resistance) = V (voltage) \div I (current)

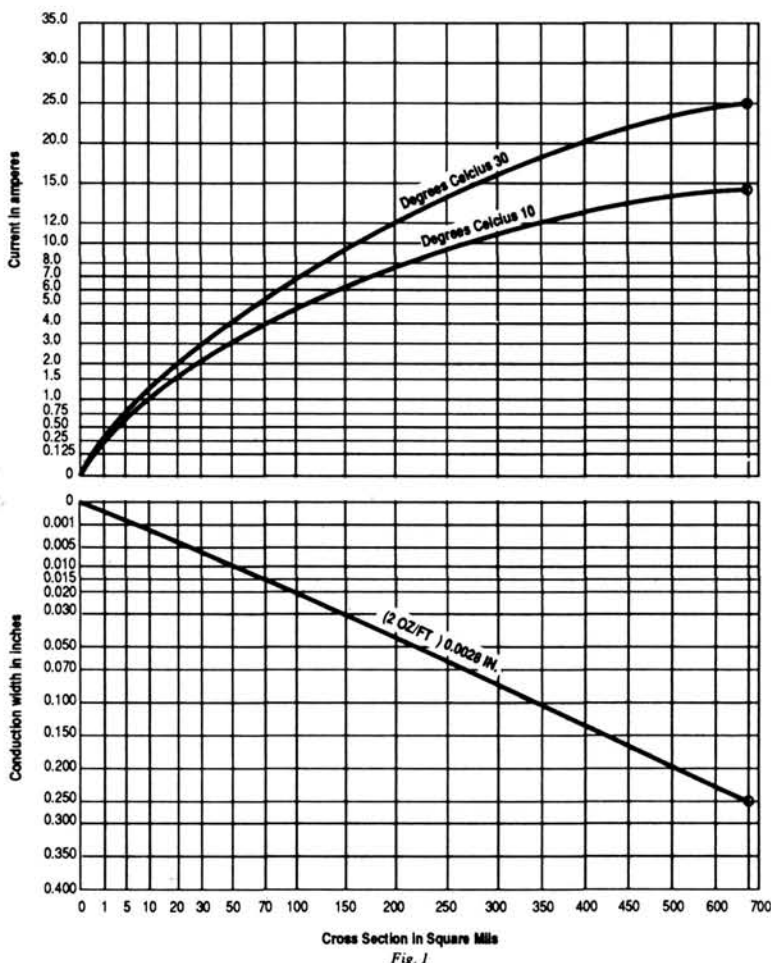
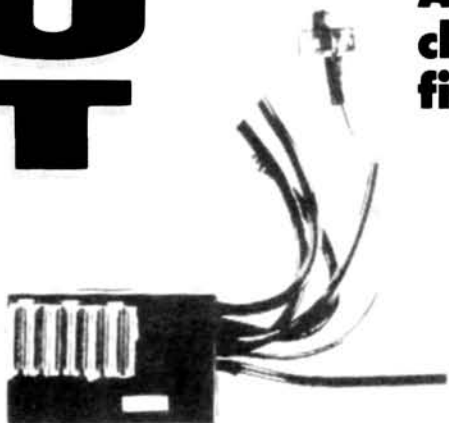


Fig. 1

Now that you know the symbols and the equations, here's a circuit (Fig. 3) that resembles the circuit of the speed controller in the model.

Most of the speed controllers tested claim a continuous-current rating in excess of 100 amps. After seeing this rating, I referred to a book called "Reference Data For Engineers,"* in which I found two references I needed to prove that these *claimed* controller current ratings are *fiction*. The first is a graph of the current-carrying capacity for various temperature rises above ambient (room temperature) for printed circuit boards. (See Fig. 1.)

The second is a chart of recommended continuous-current ratings for various sizes of copper wire. (See Fig. 2.)

You can see from the bottom graph in Fig. 1 that the printed-circuit board can come with different thicknesses of copper. The standard board comes with 2 ounces of copper. Also notice that the conductor width can vary from 0 to 3/8 inch. We'll assume a conductor width of 1/4 inch for the output. From the vertical line drawn on the graph, you can see that the maximum continuous current the printed-circuit-board conductor can carry before becoming very hot, and eventually burning through, is 35 amps.

On the chart in Fig. 2, you'll see that, as the wire gauge number goes from 32 to 0000, the diameter of the wire is increasing and so is its current-carrying capability. On most speed controllers, the wire used for the battery and motor connections is 10 gauge. Look at the 10-gauge wire row on the chart; it has a free-air current-carrying maximum of 55 amps, a diameter of approximately .1 inch and a resistance of 1.31 ohms per 1,000 feet. Since we need only 1 foot of wire for the installation, the resistance of the wire becomes .00131 ohms.

What does all this mean? Well, from these two facts we can infer that

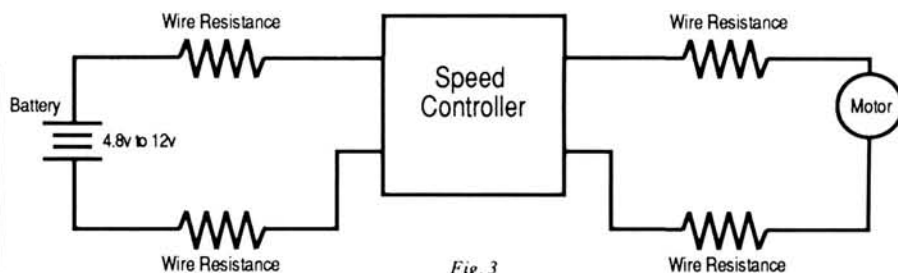


Fig. 3

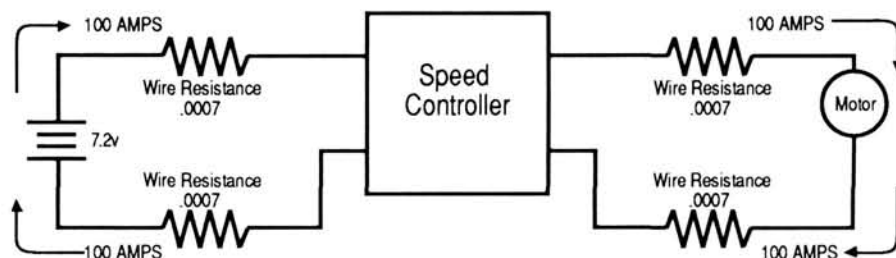


Fig. 4

RECOMMENDED CURRENT RATINGS (CONTINUOUS DUTY) FOR ELECTRONIC EQUIPMENT AND CHASSIS WIRING

Wire Size			Copper Conductor (100°C) Nominal Resistance (Ohms/1000 ft.)	Copper Wire	
AWG	Dia. In.	Circular Mils		Wiring in Free Air	Wiring Confined
32	.008	63.2	188.0	0.53	0.32
30	.010	100.5	116.0	0.86	0.52
28	.013	159.8	72.0	1.4	0.83
26	.016	254.1	45.2	2.2	1.3
24	.020	404.0	28.4	3.5	2.1
22	.025	642.4	22.0	7.0	5.0
20	.032	1022	13.7	11.0	7.5
18	.043	1624	6.50	16	10
16	.051	2583	5.15	22	13
14	.064	4107	3.20	32	17
12	.081	6530	2.02	41	23
10	.102	10380	1.31	55	33
8	.129	16510	0.734	73	46
6	.162	26250	0.459	101	60
4	.204	41740	0.290	135	80
2	.258	66370	0.185	181	100
1	.289	83690	0.151	211	125
0	.325	105500	0.117	245	150
00	.365	133100	0.092	283	175
000	.410	167800	0.074	328	200
0000	.460	211600	0.059	380	225

Fig. 2

the speed controllers can't handle 100 amps continuously. Now let's add the data we've collected to the speed-controller installation circuit. (See Fig. 4.)

Let's assume that we have a motor that draws 100 amps. Now, using equation (A), we can find the voltage drop across the battery wires of the

(Continued on page 164)

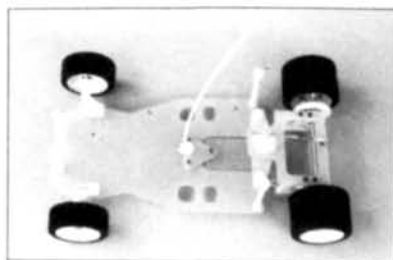


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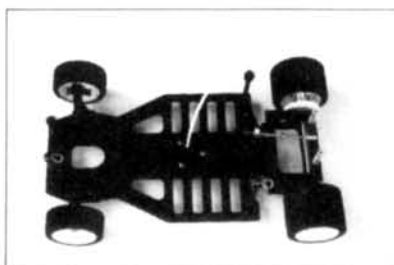
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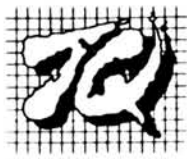
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INDIANA CHAMPS

(Continued from page 63)

race was between Terry Watson and Seybert for second place.

Watson, an Indianapolis resident, drove a TRC Pro-10 powered by a Linder Electric motor. He beat Seybert by a hair, getting through lapped traffic slightly more cleanly. Even so, they were two laps down from first place, and they both had a lap up on fourth place.

In this final, local racer Mike Beeman experienced one of the biggest disappointments of the day. Beeman was racing a scratch-built chassis, uniquely designed to reduce unsprung weight. Although he was slightly down on power, he appeared to be headed for a top-three finish, until he careened off the foot of a racer who had errantly sauntered onto the track to pick up his own race car; suddenly, Beeman's day was over.

Road Wizards, 1/12-Scale and Production Classes provided fierce competition. Perhaps the Road Wizards were the most realistic with their scale Indy bodies. Like their full-scale counterparts, which also run on parking lots from time to time, the Wizards' fragile suspensions collapse quite easily with their open-wheel design; racers tried their best to keep clear of one another, and of the barriers. Attrition in all classes was high, but in Road Wizard, it was devastating.

If 1/10 Scale offers pure racing, nothing tops the Truck Class for pure entertainment. The tall, overweight, overpowered behemoths provide each racer with the ultimate challenge—keeping the rubber side down. Anderson racer Mike Davis took the pole with 28 laps, but it was Ed Robinson's Associated RC10/JG Conversion that took top honors in the final. Robinson, from Indianapolis, used his third position on the grid to survive the inevitable first corner melee, but in the early going, he was no match for local racer Trent Norris. Norris, who qualified in second place, took the lead in the first corner, and he began to take on backmarkers by lap three. Unfortunately, one competitor put Norris's scratch-built Big Bear into the outside retaining wall, and his right front tire popped free. Following a lengthy pit stop, he recovered to finish third, three laps back.

All wasn't lost for the local guys: Anderson racer Dave Whitsel took top honors in Concours with a beautifully prepared, burgundy and silver Nissan GTP.

It was hard to believe that this was the
 (Continued on page 90)

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INDIANA CHAMPS

(Continued from page 88)

first major regional event put on by RPM Racing: The entire day was run beautifully. Hal Empey, on loan from AKS Distributing and Gonzo Products, served as announcer and coordinator, and McAllister Racing and Gonzo joined as co-sponsors. R/C racing will certainly be hearing more from Anderson and RPM Racing next year! ■

CHEMICAL WARFARE

(Continued from page 31)

Dan's RC Stuff* produces a lubricant that handles dirt in a different way. Dan's Banana Lube stays wet after application, but it doesn't draw dirt into the bearings. Instead, a crust of dirt (like a scab) forms outside the bearing, and this actually protects the inside of the bearing. Banana Lube is also non-toxic and has a maximum working temperature of 550 degrees. As the bearing heats up, Banana Lube's lubricity actually increases.

Motor sprays and cleaners are another field where the chemists are doing battle.

(Continued on page 108)

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(Graph shown represents actual computer readout of Reedy Modifieds motor.)

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A&L TRAILING ARMS

Keep up with technology,
or be left in the dust.

by RICK HOULE

"IF IT AIN'T BROKE, don't fix it" has always been my philosophy when developing an R/C race car. We live in a world of change, however, so perhaps my policy should change to, "If it's improvable, improve it!" When I bought my first RC10 in 1985, there was no doubt in my mind that I had the finest 1/10-scale, 2WD, off-road race car in the world. If technology stood still, that statement would undoubtedly still hold true. In the real world, though, competition forces us all to constantly push to the limits, and if you don't press yourself, you'll soon be left in the dust.

Allec & Lane (A&L) Manufacturing* in Corona, CA, has combined the great driving abilities of Chris Allec (presently the NORRCA 4WD National Champion) with the manufacturing skill of Daryl Lane to produce some very impressive after-market, conversion kits for the RC10 and Ultima cars. One of their premier products, and the subject of this article, is the A&L Trailing Arm rear suspension conversion kit designed for the RC10.

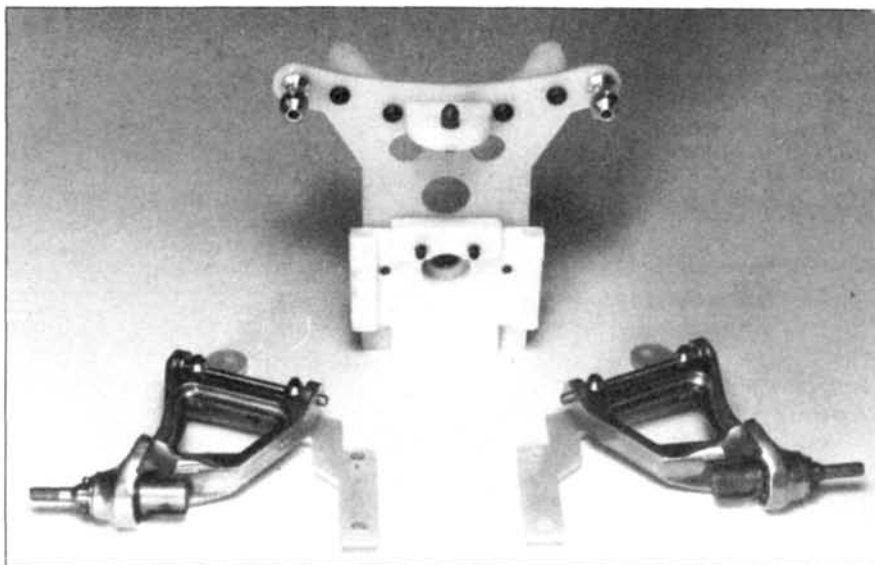
My apprehensions about this kit were soon dispelled by the ease with which all the components went together. The neat packaging allows you to review all the parts before removing them for assembly. Whether you're a novice car builder or an experienced enthusiast, you should first read the instructions carefully and familiarize yourself with the parts and their assembly. However, the instructions are short of diagrams, and the steps seem somewhat out of order. A little more info on shock set-up and oil viscosities would also be a big help. Aside from these small shortcomings, I was extremely impressed with the quality of the kit, and the polished finish of the aluminum parts

looked impressive.

The RC10 Conversion Kit (part No. RC10C1) is designed to fit either the stock aluminum pan chassis or many of the trick graphite chassis available. I think it's easier to work with a graphite chassis, because the stock pan conversion requires extra drilling and filing to complete. Some after-market chassis (those narrower than 4 7/8 inches wide) won't accommodate this kit, so do some research before you buy.

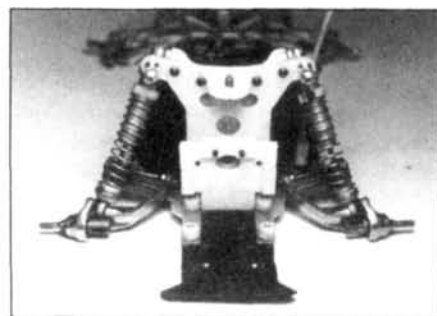
INSTALLATION: Step 1 of the instructions deals with modifying the stock aluminum tub of the RC10, but using a graphite chassis, I was able to bypass this step completely.

Assuming that you have an already built RC10, first remove the rear bulkhead, swing-arm blocks, shocks and transmission. The instructions tell you to build the parts onto the car, but I found it easier to first put together the three basic assemblies of the kit, then to bolt them to the



To convert the RC10 to a rear trailing-arm configuration, A&L has produced this simple kit.

Photos by Rick Houle.



Before the gearbox has been installed, the trailing-arm system is easy to see. Take your time.

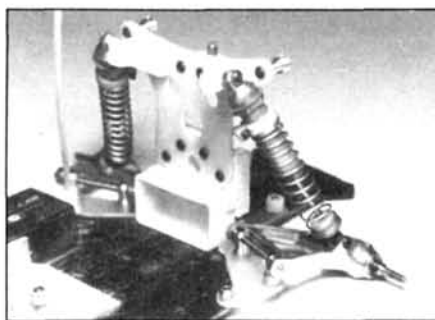
chassis. The three major assemblies are: the left and right trailing arms with mounting plates; one shock tower with shock blocks; and a body mount. The "mounting ears" of the stock RC10 rear bulkhead must be removed with a modeler's saw. The mounting ears are those square blocks (with holes) protruding from both sides of the bulkhead to which

the stock A-arm control links are attached. They aren't needed for the trailing arms, and they may interfere with the arm's travel.

When installing the new shock tower, be sure to use the nifty button-head, hex-screws included in the kit. They're not only lighter than the stock ones, but are also more streamlined. The new body post itself is rather small and was later ripped out in a bad crash while racing.

After that, I mounted the block a little lower on the tower and used the beefier Associated* body post, and I've since had no problems. Just use your imagination here. Next come the trailing arms, or "trailers," as I refer to them. At this point, take note of the four suspension hinge posts; there are two tall posts and two short posts. Also notice that the holes for the hinge pins are drilled out at an angle.

The two short posts are attached to the inboard part of the mounting plates, and the tall posts are mounted outboard. Without tightening them, attach the posts to the mounting plates with four 4x6 button-heads, so that the hinge-pin holes are angled downward toward the center of the car. The instructions tell you to install the arms to fit first, then remove them to install the axles and bearings, but I see no reason not to install the axles and bearings first. Next, position the arms on the posts and insert the hinge pins through the arms and posts. Center the hinge pins on the assembly, then check for free travel. When everything is satisfactory, remove the screws one by one and reinsert them using a thread-locking compound on all four grub-screws. Care must be taken to avoid getting the thread-lock on the hinge pins. When the left and right assemblies are complete, attach them to the chassis using four button-head screws and nylon locknuts. The most forward parts of the mounting plates have two tabs, each with a 1/8-inch hole, and these must be bolted down. With the mounting plates securely in place on the chassis, use one of these holes as a guide to drill a



Before you purchase the A&L system, be sure your RC10 chassis is wide enough to accept it. Notice how the mounting plates are right on the edge of this chassis.



Houle's RC10 handled much better with the A&L Trailing Arms installed.

1/8-inch hole through the chassis. Secure each tab in place with a 3x8 screw, a 3mm flat washer and the aluminum locknut provided. When you bolt the bulkhead/tower assembly onto the chassis, to accommodate the bulkhead, you'll have to trim the two forward nylon nuts with a hobby knife. Mount the shocks onto the trailers using a 3x14 button-head and the stock RC10 shock ball. Make sure that the ball end of the shock ball is toward inboard and that the flat, flange part is facing outboard.

You'll probably have to use rubber surgical tubing inside the shocks (on the shock shafts) as limiters, so that the trailers don't over-extend and damage the system. A&L recommends running "1/2 to 1 inch of maximum ground clearance (downward travel), with a race-ready height of 1 inch." Next, check the fit of the tranny between the mounting plates on

the chassis. I had to file the tranny case down slightly to fit between the plates. Last, but certainly not least, position dogbones, springs and nylon washers, lower the tranny into position and bolt it down.

There are no shock-oil weight recommendations in the instructions, so I started with 50WT, synthetic oil—the same weight I was using with my stock suspension—and eventually wound up with 30WT synthetic.

PERFORMANCE: After hacking up the body shell to fit over the new shock tower, I took the rig out for a road test. The car was remarkably stable over the jumps, and steering seemed much more forgiving on rough terrain. During the road test, I couldn't find a single flaw in the conversion, so I headed for the race-track. I eventually discovered that I had to adjust my driving style, using the brake more often in tight turns to swing the rear end around. To my delight, I was able to punch the throttle out of the turns a lot sooner than usual while maintaining good control. I was also able to go deeper into the turns before letting off the throttle, and to accelerate sooner exiting the turns.

Keeping in mind that the car's suspension was totally different, I ran one battery pack for the road test, one pack for a pre-run on the race course, and, next, I was fifth qualifier in an A-Main with 12 cars. I then capped this with a third-place trophy! Nuff said!

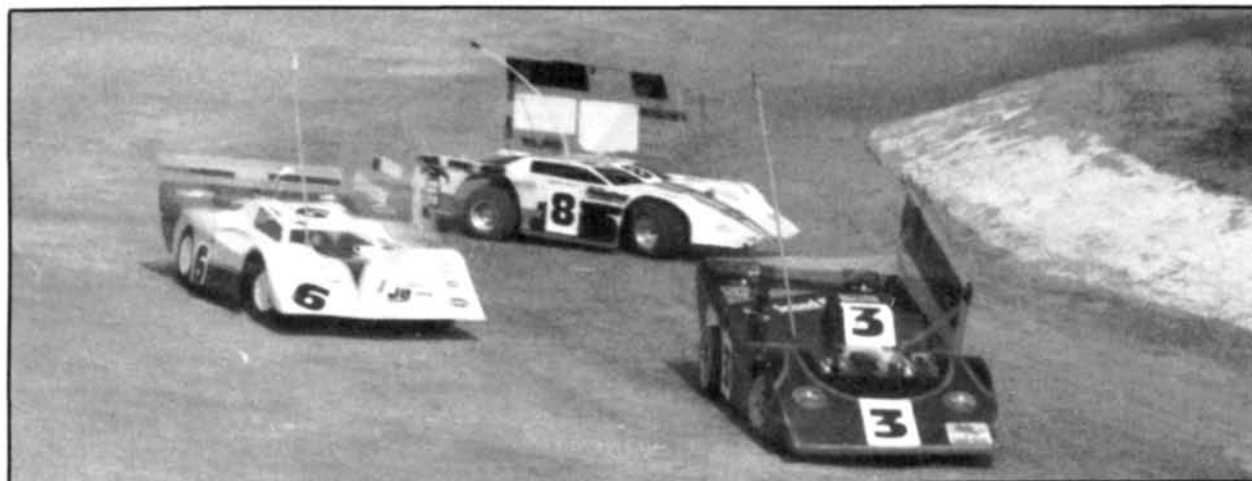
**Here are the addresses of the manufacturers mentioned in this article:*

A&L Manufacturing, P.O. Box 2115, Corona, CA 91718.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626. ■

The Pole Position

by RICH HEMSTREET



Cars No. 3 and No. 6 are exhibiting mild understeer, while car No. 8 shows severe oversteer.

CAN YOU TELL if your car is pushing? By "pushing," I don't mean running into the rear end of a slower car on the straight. How about oversteer? Can you identify it and can you correct it?

First, I'll define some terms: Oversteer refers to a car losing rear tire traction while going through a turn. The front tires continue to stick to the track and the car spins out. Understeer, or push, has the opposite effect and occurs when the front tires lose traction before the rears, while going through a corner. The car will run a wider arc through a turn than the actual steering angle of the front tires. In the most severe understeer situation, you'll have the front wheels turned to full lock while the car goes straight into the wall.

Caster adjustments are used on many cars to adjust oversteer/understeer. Caster refers to the tilt of the kingpins, when viewed from the side of the car. As the top of the kingpin tilts toward the rear of the car, the caster angle increases; straight up-and-down kingpins are set at zero degrees.

So how do you keep your car from spinning out or oversteering? Assuming the car isn't broken and the chassis isn't tweaked, there are several things you can



While car No. 21 is pushing, that isn't exactly what's meant by understeer!

do. First, be sure you have the correct tires on the car. Switching to harder compound front tires will remove some of the excessive steering. Changing to softer rear tires will have a similar effect, by increasing rear-end traction.

Increasing the caster angle (tilting the kingpin back) will slow your car's steering. Many R/C dragster drivers run as much as 30 degrees of caster because they don't want their cars to turn too

easily, but a road racer would never make it around a roadcourse with that much caster. Make caster adjustments a little at a time; don't move the kingpins more than two or three degrees at a time.

Tire traction additives can also be used to reduce oversteer. By using an additive on only the rear tires, the car shouldn't oversteer as much. In many cases, especially when racing on carpet, this will be all that needs to be done. I frequently get the handling I want by adding BoLINK's* Max Trak to the *full surface* of *both* rear tires, while using it on just the *inside third* of each front tire.

Aerodynamics can also be used to correct oversteer problems on highspeed racecourses; a body with a blunter front end can decrease your car's steering. In R/C stock-car racing, the BoLINK '83 T-Bird works better than the more swoop-nosed BoLINK '87 T-Bird. The '88 Pontiac body seems to provide very little front-end downforce, so oversteer isn't much of a problem.

At Lake Whippoorwill International Speedway, $\frac{1}{10}$ - and $\frac{1}{12}$ -scale cars are traveling at nearly 50mph. Even the most neutral bodies still provide too much steering, and the only way to overcome oversteer on high-speed ovals is by using

(Continued on page 98)

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POLE POSITION



At high speeds, you want very neutral handling characteristics.

a large rear spoiler or wing. The spoiler and wing help to glue the rear tires to the pavement, thus counteracting the oversteer.

As you might imagine, since understeer is the opposite of oversteer, so are the remedies. Softer front tires and harder rear tires can be used. On cars with adjustable caster, you can decrease the caster angle (move the kingpins to a more upright position). You might be surprised how much difference a small caster adjustment makes.

Using traction additives on the front tires will greatly increase the steering. However, I've never seen a car using additives *only* on the front tires, because that would usually cause instant oversteer. Ordinarily, understeer is dealt with by treating the *full width* of both the front and rear tires.

A wedge-nosed body can increase the aerodynamic downforce on the front tires, and thereby reduce understeer. Lowering or removing a rear wing will also decrease understeer.

The ideal situation is to have a car with perfectly neutral steering. The car should turn corners in direct relationship to the steering angle of the front tires, and the rear tires should always follow the front tires around the corners. But the ideal

situation is seldom found on a racecourse; there are usually some compromises.

Given a choice, it's easier to drive a car that understeers than one that oversteers. The car that understeers can usually be controlled by backing off the throttle a little earlier than is usual. Once you get into a rhythm, you'll be able to click off consistent lap times. A car that oversteers will be capable of quicker lap time, especially on tight roadcourses, but consistency will be impossible. The more pronounced the oversteer problem, the harder the car will be to drive.

It doesn't usually cost very much to dial-in your car's handling; it just takes a little time and experimentation. But the dividends are much greater than those gained by just bolting in the latest "Super Turbo Blaster" motor. A good-handling car will beat a poor handling rocket-ship race after race. So the next time you're racing, be aware of whether your car is oversteering or understeering, and remember what to do to correct it. It's a lot of fun to race a car that handles well.

**Here is the address of the company mentioned in this article:*

**BoLINK R/C Cars, Inc., 420 Hosea Rd.,
Lawrenceville, GA 30245.** ■

FEBRUARY ISSUE

STOCK CAR
SPECIAL

PART TWO



HYPERDRIVE CONVERSION

by STEVE POND

BELTING IT OUT IN THE DIRT

IN PART I OF THE RC10 Hyperdrive Conversion article, I showed you how to reverse the motor-mounting location to use the Hyperdrive, instead of reversing the polarity on the motor. In Part II, I'll tell you how the S.S. Industries* Hyperdrive actually performed.

Before the Hyperdrive could be used on the RC10, the motor mount needed some modifications to allow for additional adjustment. Regardless of whether you choose to reverse the polarity of the motor or to move the motor-mounting plate to the other side of the transmission, you'll have to drill an additional mounting hole on the lower side of the plate, approximately 1/4 inch to the rear of the original mounting location. This hole must be parallel with the upper slot in the

mounting plate to allow attachment of the motor. The people at Litespeed told me that they're in the process of manu-

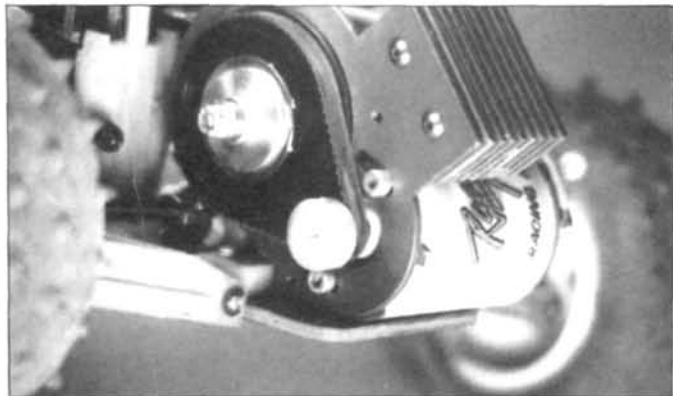
facturing a new Litesink for the RC10 (similar to the prototype used on this RC10), and this will allow installation of the Hyperdrive without modifications.

As I began testing the Hyperdrive, I found that the thin, inner flange on the motor pulleys interfered with the flange on the transmission pulley. A simple solution to this, and one that has already proven effective in on-road racing, is to simply remove the inner flange by twisting it with a pair of pliers.

The next obstacle I encountered was that the bearing holder in the can of the motor protruded too far through the motor-mounting plate and prevented

HYPERDRIVE CONVERSION

the motor pulley from lining up with the transmission pulley. If these two pulleys aren't aligned in the same way as the pinion and spur gear combination, the load will increase on only *one* portion of the belt instead of being evenly spread, and this will cause the belt or pulley to strip. This was rectified with the use of a motor-mounting shim similar to those on the Optima Mid. This or any other shim of similar thickness (preferably aluminum or another metal that will allow heat transfer), will move the motor back far enough to align both pulleys.



To use the Hyperdrive, the lower hole in the motor-mounting plate must be slotted approximately 1/4 inch for additional adjustment. To allow proper alignment of the belt, a motor spacer from a Kyosho Optima Mid was also used.

With these modifications complete, you're ready to select a ratio that best suits your track conditions; a good gauge is the ratio you ran with a pinion/spur gear configuration. With this as a starting point, try to find the same ratio with the pulleys and the proper-size belt. (There are different sizes to accommodate all pulley combinations.) The next step (which requires close attention) is the adjustment of the belt tension. This is especially important when running a stock-class motor that doesn't have bearings to absorb the lateral loads created by an over-tightened belt. Ideally, you want to leave the belt tension as loose as possible without slipping, as this will eliminate some of the friction that reduces horsepower. The flip side of the coin is that if the belt is too loose, you may end up stripping it.

The motor is a good user is that you can't separate two gears, add a third member and expect it to be more efficient. While this may *sound* correct, I'm not one to argue with results.

In on-road racing, the Hyperdrive made its debut at Lake Whippoorwill Speedway during the Car Action Weekend. Driven by Ralph Burch Jr., the Hyperdrive car got off to a shaky start, but once his car was dialed, Ralph turned in a qualifier three laps faster than the 2nd-place car, and finished the feature *nine* laps ahead of the 2nd-place car. However, this wasn't the only successful car. A number of other drivers also using the Hyperdrive placed very well, proving that this system is one to reckon with. Of course, you can't compare off-road racing with on-road, but as I said before, you can't argue with results!

Initial testing of the Hyperdrive was with a stock motor—one of the biggest concerns, because it lacks ball bearings. With the stock motor, there was less likelihood of stripping the belt, for the obvious reason that they don't have the raw power that the

modifieds do. However, stockers use higher gearing, which results in a larger motor pulley, and this pulley has more teeth on the belt than a smaller one, giving it more grip.

As the RC10 whispered its way around the track with the Hyperdrive in place, the car simply didn't *seem* as fast, but I was proven wrong, because in each good lap, it was over half a second faster than it had been with the gears. The belt seems to dampen the vibration and noise that's normally transmitted through the gears, and this gives the illusion of a slower average



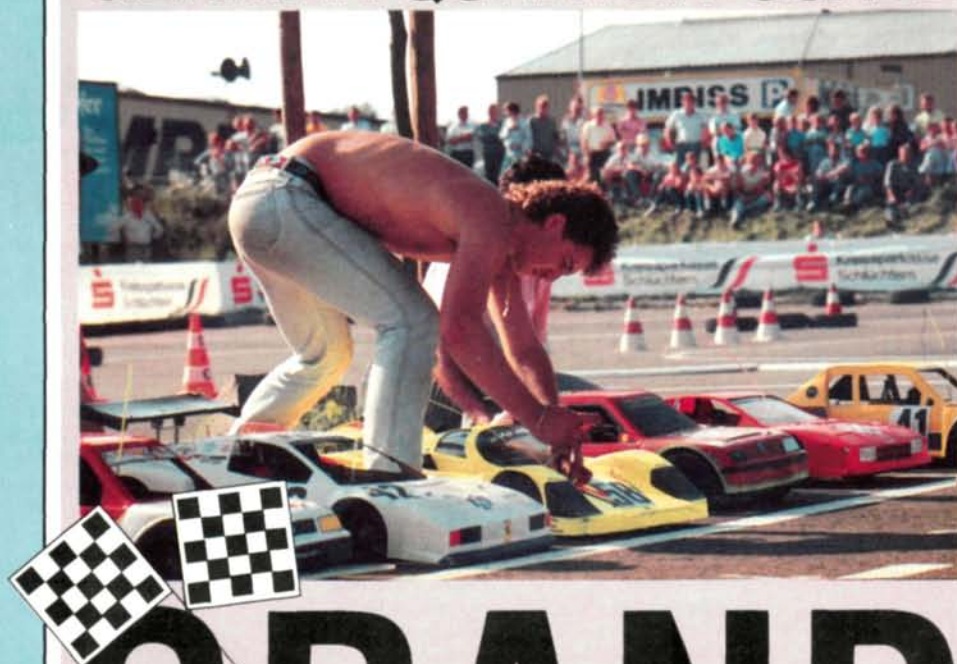
These are the three components that make up the Hyperdrive system. To prevent contact with the spur pulley (black), the thin flange of the pinion must be removed by twisting it with a pair of pliers.

speed. My concern was how the Hyperdrive would perform with the power of a modified motor behind it. With modified motors, you must run with lower gearing to compensate for the high speed of the motors. This means using a smaller pinion which, as mentioned before, leaves fewer teeth for the belt to grab hold of. One thing the Hyperdrive has going for it when running a modified is that the ball bearing can tolerate a much stronger lateral load than the bronze bushing in the stockers. The first modified I strapped into the RC10 was a rather mild, 22-turn motor. With the belt tension just a hair tighter than usual and a 13-tooth motor pulley, the belt didn't skip once. After running a few battery packs through with the 22-turn motor, I replaced it with a 17-turn motor. At this point, I began to notice the effect dirt was having on the belt and pulleys. Despite claims that this system cleans itself of debris, the belt had sucked in a couple of foreign particles and it was becoming noticeable that these were taking their toll on the large plastic pulley. The 17-turn motor seemed to be just about borderline for the Hyperdrive, with an occasional skip under heavy acceleration. This isn't to say that it couldn't handle that kind of power (I've seen it run with 10-turn motors), but if there was a cover that could protect the belt from the *opposite* side, you might have an easier time keeping the pulleys clean.

The Hyperdrive system has already proven itself to be effective in 1/10-scale on-road racing. The way it performed on my RC10, you can bet a lot of gears will sit in toolboxes as racers try belts and pulleys in the dirt in '89.

Here is the address of the manufacturer featured in this article:
S.S. Industries, 2109 Patti Ave., Springsdale, AZ 72764. ■

GERMAN QUARTER-SCALE



GRAND PRIX

Action on the European 1/4-Scale Front

by NANNI MANARA

The Grand Prix of Germany shows that 1/4-scale racing isn't a strictly American activity. Unlike U.S. racers, the Europeans run their quarters on road courses. The GP was held on a track that was designed for 1/8-scale racing, and this international event drew 81 entrants from 10 countries.

(Continued on page 106)

GRAND PRIX



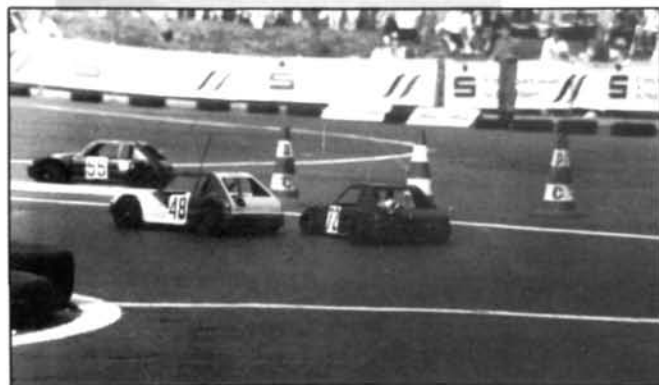
The large Schluchtern course had traffic cones and tires marking the corners. Both the pit area and the starting grid were directly in front of the covered drivers' stand.



The German GP had a class for the Commando—a .21 glow-plug engine DWA 1/4-scale motorcycle. These bikes are extremely realistic as they lean through the corners.



Here, a competitor readies his cycle for the next round of racing. Even though they're 1/4 scale, they aren't too large to handle easily.



Racing 1/4-scale cars side by side on a road course requires excellent chassis set-up and intense driver concentration.



Thrashing in the pits is the same everywhere in the world, no matter what the scale of the race cars.

CHEMICAL WARFARE

(Continued from page 90)

For cleaning motors, BoLINK* offers Electro Whirl, suggesting that you dip the motor (while running) into a cup of it, so

cleaning out all debris. After dipping your motor, be sure to re-lubricate the bearings or bushings.

Power Plus, also from BoLINK, is applied with an eyedropper while the car is on the starting grid. If you're ready at the green flag, Power Plus may help you

get through the first turn before the usual crash, but be careful not to over-power your car's cornering ability with this instant power.

Dan's Motor Spray is a non-toxic motor and bearing cleaner. In fact, several racers even use it as a hand cleaner. Motor Spray won't harm plastics in any way. There are three power settings on Dan's CO₂-powered cans: Low is for cleaning excess oil off your car, and high is used for bearing cleaning.

Paragon's Formula 1 spray also has a three-position nozzle to vary the spray rates. By spraying it into the end bell of your motor while it's running, the extension tube can be used to provide an instant tune-up.

Using traction additives is another chemical method of improving your race car's performance. Depending on the track's condition and how you want your car to handle, additives can really get you dialed-in. If your car needs more traction in the rear, you can dope only the rear tires. To correct understeer, you apply these chemicals to the front tires, but beware—it's very easy to get too much bite in the front tires, and this can cause your car to spin out turn after turn. Try

(Continued on page 112)

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COBRA

H₂O-Go

by MIKE LEE

ONE OF THE MOST enjoyable features of the world of R/C cars is its versatility. There are so many different vehicles out there that deciding what to buy is tough, but fun, and when you have that first vehicle, the door swings wide open for more than just cars. In my case, the door has opened to the world of fast electric boats. I'm not talking about boats that just putter around the lake and entertain ducks; I'm talking about wave-rippin', get-out-of-my-way-or-get-hit fast electric boats—radical racing machines!

The new fast electrics are not only very exciting, but also really easy for us car fanatics to get into. You already have the radio, the batteries, the chargers—even the motors—for any type of fast electric boat, and all you need to add is the boat. And have we got the perfect boat for you to get started—the Graupner

Cobra from Hobby Lobby*.

The Cobra is a small, but potent, fast electric powered by a standard 05-size motor, six to seven battery cells and a mere two channels for control. Sound familiar?—it's the same as the stuff you have in your car. The hull is a basic two-piece affair of ABS-type plastic. Like our car bodies, it needs some trimming to get it in shape for fitting. The Cobra's main feature is its use of the Graupner Speed 500 Outdrive propulsion unit. This unit consists of the motor, gearbox, drive shaft, and a steerable-prop surface-drive setup that's superior to the underwater drives found on many electric boats. Let's look at how a ground-

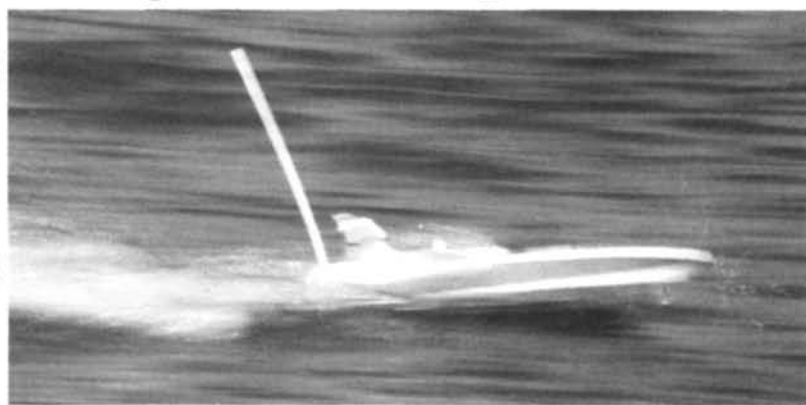
pounding car driver can get one of these mini ocean racers into operation.

ASSEMBLY: This begins with the hull, which is made of two large pieces of vacu-formed ABS plastic. At first sight, the plastic seems thin and flimsy, but it's strong enough to handle even a gas engine. In fact, the instructions tell you how to install a .10-size gas motor. I started with the lower hull, trimming it along the upper edge to meet the cut line. When this is done, the rear bulkhead is installed against the transom, which is at the rear of the boat (the stern). Once in place, the drive-shaft tube is installed through a hole at the rear and bottom of the boat, and this shaft hole must be sealed completely to prevent leaking.

One of the best aspects of this kit is that Graupner has taken the time to ensure longevity and easy maintenance. This is seen with the fitting of a lube port mounted on the drive shaft about halfway down the shaft. This allows the modeler to lubricate the tube (the stuffing box), and this oil not only keeps the shaft lubed, but also helps to prevent water from sneaking up the shaft and into the boat.

When the shaft is in place, the gearbox is fitted and glued to the bottom of the hull. (The kit provides a tube of Graupner's own adhesive—Stablitz Express—and this virtually welds items to the hull. However, in a pinch, instant glue could also be used). The motor and gears are fitted onto the gear box, which reduces the motor speed to the shaft by a ratio of 2.5 to 1. (We'll soon see how this works.)

The prop shaft is now placed in the stuffing box and set to the gears with a standard hex setscrew. I recommend filling flat spots on the shaft for the setscrew. At the rear, the out-drive unit of the Speed 500 is attached to the transom with three self-tapping screws. The drive unit is simple, but very effective, and it can be adjusted for drive angle to trim out the boat's riding angle on the water. Once in place, you can see how the small universal joint allows the prop to move to the left and to the right for steering without hanging up the shaft. As mentioned



COBRA HOBBY LOBBY

Type Off-shore racer
Sug. Retail Price \$62.95

DIMENSIONS:
Overall Length 23½ inches
Beam (Width) 6¼ inches

WEIGHT:
Gross (w/bat.) 2½ pounds

HULL:
Type Deep-vee
Material ABS Plastic

DRIVE TRAIN:
Type Surface-drive gear reduction

Ratio 2.5:1

ELECTRICAL:

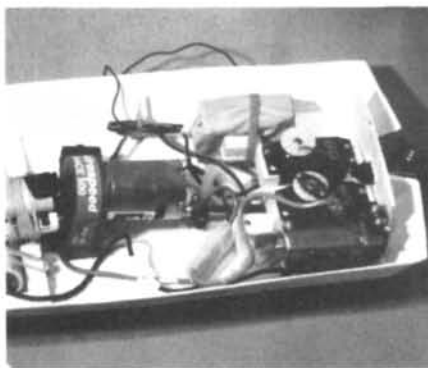
Motor 540-type
Speed Controller BoLINK or Parma resistor-type
Battery Type Required 7.2V to 9.6V

OPTIONS AS TESTED:

KO Propo EX-5, BoLINK mechanical resistor speed controller.

COMMENTS:

The Cobra handles very well in choppy water and accepts all the support goodies we use in our 1/10-scale electric cars.



Look familiar? KO servos and a BoLINK mechanical speed controller all hooked up to Kyosho 8.4V battery. Graupner's 540-size Speed 500 is a very hot little motor, but any "hot wind" will bolt to the transmission.

earlier, this unit is a surface-drive unit, and this means that the prop rides half in the water and half out. (Sounds strange, but believe me, it works like crazy.) This allows the use of a larger, more efficient prop without loading down the motor and causing excessive current drain.

When the propulsion unit is in place, the radio gear can be installed. It's a bit small in there, but nothing that we car drivers haven't seen before. As a matter of fact, there's more room in this boat than in any 1/10-scale electric car, and a



The Cobra's hull, deck, wing and other parts shown are ABS plastic. Note the decal package in the lower left-hand corner. No painting is required. The easy-to-assemble Hydro-speed drive system (center) is in its own blister pack.

standard radio will fit inside easily. The kit has a radio tray for mounting, but the fit will depend on the type of servos and speed controller you use. I had to deviate slightly to fit the radio gear, but had no real problem.

The radio I use is the same radio used for many car reviews: the KO Propo EX-5 radio from Hobby Shack*. This is a 2-channel rig with end-point adjustment,

(Continued on page 178)

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CHEMICAL WARFARE

(Continued from page 108)

doping *only* the *inside third* of each front tire to improve your car's steering. Usually, you can get a car's handling balanced by doping the entire width of both rear tires and only a portion of the front tires. Experiment to see what works best on your track.

BoLINK makes Max-Trak for concrete and asphalt racing surfaces. This works best when the tires are soaked (full rears, partial fronts) and left to dry in sunlight. (The tires really get tacky.) BoLINK has also started selling Carpet Tack, which is specifically for all those racers who race on indoor/outdoor carpeting all winter.

Paragon's Ground Effects has been used effectively both indoors and outside. Like any of these additives, experiment to figure out what will work best for you.

Many other potions are being mixed as racers search for an unfair advantage in the "chemical war!"

**Here are the addresses of the companies mentioned in this article:*

Paragon Racing Products, 8802 Knollwood Dr., Eden Prairie, MN 55344.

Dan's RC Stuff, 9525 C. Cozycroft Ave., Chatsworth, CA 91311.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245. ■

JAVELIN

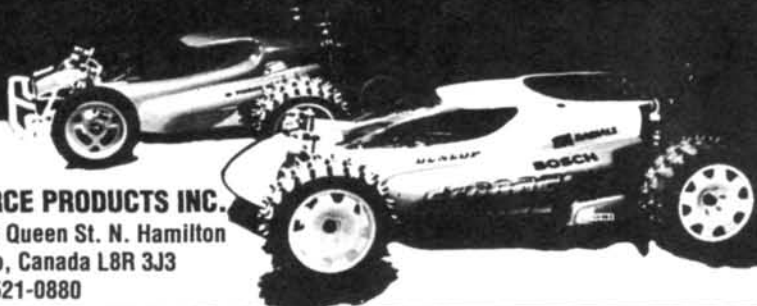
(Continued from page 35)

turnbuckle-type rods with left- and right-hand threads to allow adjustment without having to remove them. These rods are made of ultra-strong titanium, and if you happen to break or bend one of these, you've simply crashed way too hard. The choice aluminum wheels are also from Tecnacraft, and they're probably the finest-looking set of wheels you can attach to an R/C car. At the same time, these wheels also perform well. Aluminum wheels are considered too heavy for most racing applications, but the Tecnacraft wheels are comparatively light. Plastic or nylon wheels are obviously lighter, but if you want great-looking wheels and you don't mind scratching them, these will fit the bill. These wheels also allowed me to adapt a set of Schumacher* tires to the Kyosho car. The narrow front tires used on the Schumacher have always been effective, and I'm certain that these tires will give the front end a little extra bite.

(Continued on page 114)

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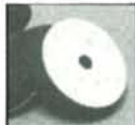
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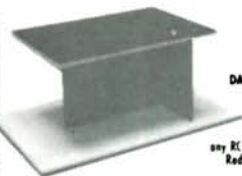
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JAVELIN

(Continued from page 112)

Have you been wondering why I keep calling this car a "Javelin" when it has a Turbo Optima body? I chose the Turbo Optima body, not only because it fit without modification, but also because it protects the electronics more than the open-cage body that comes with the Javelin. After installing a set of bearings, the wheels were attached, and then all that remained was the electronics.

To power the Javelin, I used a Trinity No. 2002 Monster Horsepower modified motor, a Novak* 1X electronic speed control and Reedy* Matched Sanyo SCRs. Without going into a detailed explanation of how these components perform, I'll just say that they've won enough national and world titles to speak for themselves. A sharp eye will also pick out the PCM receiver used on the Javelin. On the other end of that receiver is Futaba's* new Magnum PCM 1024 radio system. Comment on this was reserved for a reason: While I've had the chance to get a feel for the radio while testing the Javelin, I've hardly had a chance to explore its capabilities. There-

(Continued on page 117)

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JAVELIN

(Continued from page 114)

fore, I can't give you an objective assessment of how this system performs until I've done further tests. My initial impression of it is very good, but this system is by no means something a casual racer should consider buying in the hope that it will make him a better driver. This has everything to offer the competitive racer, but research your choice carefully to determine whether or not you'll be able to make use of these features. More on this in a later issue.

Tests of the Javelin revealed almost immediately that the addition of the ball diffs allows you to put the car on the track where you choose, instead of turning full-lock and waiting for it to plow its way through the turn. While the cars running mid-motor will have the slight advantage of more weight on the front wheels, this is no reason to count the Javelin out. With a few minor improvements, this car will be very competitive against the new mid-motor cars.

*Here are the addresses of the companies mentioned in this article:

Kyosho; distributed by Great Planes Model

(Continued on page 120)

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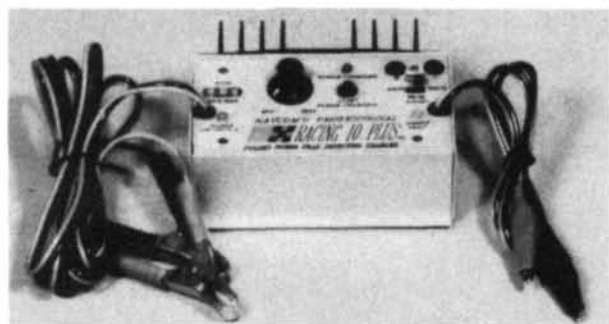
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JAVELIN

(Continued from page 117)

Distributors, P.O. Box 4021, Champaign, IL 61820.

Litespeed, E. 3703 33rd., (P.O. Box 4765), Spokane, WA 99223.

Robinson Racing Products, 501 Peach, Santa Ana, CA 92704.

Tecnacraft, 1335B Dayton St., Salinas, CA 93901.

Schumacher, distributed by TRC, P.O. Box 478, Oakboro, N.C. 28129.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

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HIGH ROLLER

(Continued from page 42)

Occasionally, the diagrams can be confusing, e.g., in Step 4 (spindle assembly), the drawing shows two holes in the top of each spindle, but there's actually only one. This may seem a small point, but confusion can result from trying to find a part that matches the one shown.

As you finish the suspension construction, try this little trick. Tie the dogbones to the suspension arms with the twist-ties that come with bread wrappers or garbage bags. Attach the ties really loosely so they don't bind up the axle. This way, if there's a crash, you won't throw your dogbone. Try it!

Don't install the motor plate until the gearbox is in the tub; this will save you a lot of frustration a couple of pages later. You'll also have to trim the bottom corners of the motor plate very slightly so that it will clear the tub. Be careful, and

(Continued on page 122)

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Prices slightly higher in Canada.

HIGH ROLLER

(Continued from page 120)

don't trim off too much!

The speed controller is really easy to assemble, but if you plan to run the truck in deep water, don't use the voltage regulator provided. (That's just asking for trouble!) If the batteries dump, you could be a long, wet way from home!

I used the Aristo-Craft* Challenger 4000 4-channel radio in my High Roller. It was extremely easy to install and performed flawlessly. It's a good radio for a beginner, and the price is very reasonable. When installing the antenna, the instructions suggest drilling holes in the tub and routing the antenna around the top. I thought this might lead to leaks, so I simply taped the antenna to the inside upper edge of the tub, and this seems to work quite well.

When installing the steering, set the rear control arm for slightly less travel. Because of the tremendous force applied to the steering linkage by the big tires, the rears may over-travel and cause the loss of a dogbone. Except for paint and detailing, the tires are the final part of the

(Continued on page 125)

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HIGH ROLLER

(Continued from page 122)

assembly. I suggest that you apply heavy grease or silicone to seal between the tires and the wheels. This prevents water from getting in and sinking your High Roller! I neglected to do this, and after a few minutes in the water, the truck began to list slightly.

PERFORMANCE: Now for the fun part! Let's get this monster rollin'! On several occasions, fellow truckers have come to me and suggested, so as not to hurt my feelings, that perhaps I ought to turn my tires around before any *real* truckers notice that they're on backwards. Too bad they don't understand hydrodynamics as we naval types do; reversing the direction of the tread turns the High Roller into a real swimmer!

Since, on my racing cars, I'm used to steering with a wheel, the stick setup of my Aristo-Craft took a little getting used to. This is somewhat aggravated by the fact that my left hand doesn't know what my right hand is doing, and when both hands are controlling different ends of the same truck, look out!

This baby reacts like a cat and turns on

(Continued on page 128)

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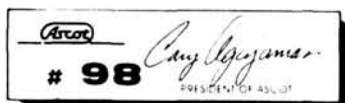
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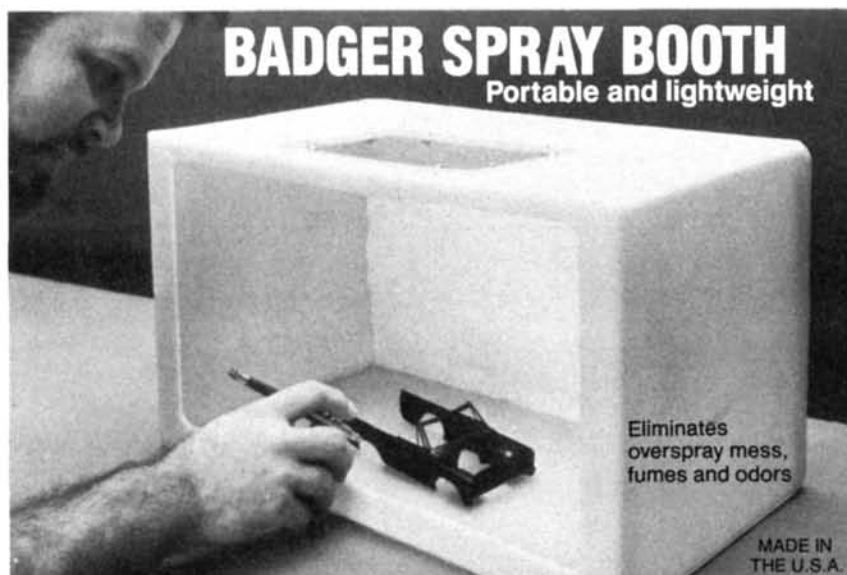
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HIGH ROLLER

(Continued from page 125)

the proverbial dime. It also has a ton of power, and the 4WD lets you climb some incredibly steep hills. Though pretty darn quick in the dunes around the lake, it's definitely a stroller in the fast-track department. One fix is to change the motor pinion from an 18-tooth to a 20 or even larger. However, one word of caution: As is, off the shelf, the gearbox uses nylon bushings and spacers, and these just won't survive any kind of high-speed runs. So before upping the voltage or tweaking the motor, purchase the optional bearing kit! Considering the cost of the kit, this is a little disappointing.

What else can I say about this truck? It's great fun, and it's extremely versatile. We had a great time running around and *through* the local pond, and then, with very little change to the setup, we took it to the park and ran it on the track. The steering is ultra-responsive, it will climb with the best of them, and it happens to be one of the *best-looking* trucks around.

MRP's monster looks very realistic with 16 shocks tucked under the pickup body. If you're in the market for a car-

(Continued on page 130)

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HIGH ROLLER

(Continued from page 128)

crushing monster truck, check out the High Roller, and after the cars have left the scene, you might try crushing sailboats on the pond!

*Here are the addresses of the manufacturers mentioned in this article:

MRP, 18676 142 Ave. NE, Woodinville, WA 98072.

Aristo-Craft; distributed by Polk's Modelcraft Hobbies, 346 Bergen Ave., Jersey City, NJ 07304. ■

SHOOTOUT

(Continued from page 48)

Driving an excellent race, Schmitz and Johnson did battle for the top spot while a run for 3rd shaped up. Eustace Moore, driving his MIP RC10, and Chris Allec, driving his A&L RC10, ran virtually side by side for the duration. Caught up in traffic, Moore became tangled with the slower cars and Allec waltzed by. Schmitz was able to fend off Johnson's attack as the clock closed on four minutes, and he broke away for a seven-second lead, which he held on to for 1st place.

(Continued on page 135)

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*GEAR CADDY

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SHOOTOUT

(Continued from page 130)

Running away with 1st place in the 4WD Open Class was Jim Dieter, driving a Trinity-powered Schumacher Cat. Dieter started in the third slot, behind Losi and Jack Johnson. With a good run right from the start, he was able to take 1st just ahead of Ron "Britches" Rosetti, who drove a Turbo Optima Mid SE and came up from the last position on the grid.

With Losi Jr. and Jack Johnson heading up the 2WD Stock Class with their JrX2s, it seemed as though, for a victory, Chris Allec in the third starting position would have to turn in a flawless run with his RC10. At the gun, Kyle Reed jumped to an early lead from the fourth starting position, while Don Jones slid his Ultima into the second spot after the first lap. Allec ran in the third spot until he and Rick Velhow passed Jones on the fifth lap. After Allec gunned past Jones for second, he set his sights on Reed, and from then on, there was undoubtedly some of the best racing to be seen. Allec was on Reed's heels for the remainder of the race, but Reed edged him out at the

(Continued on page 142)

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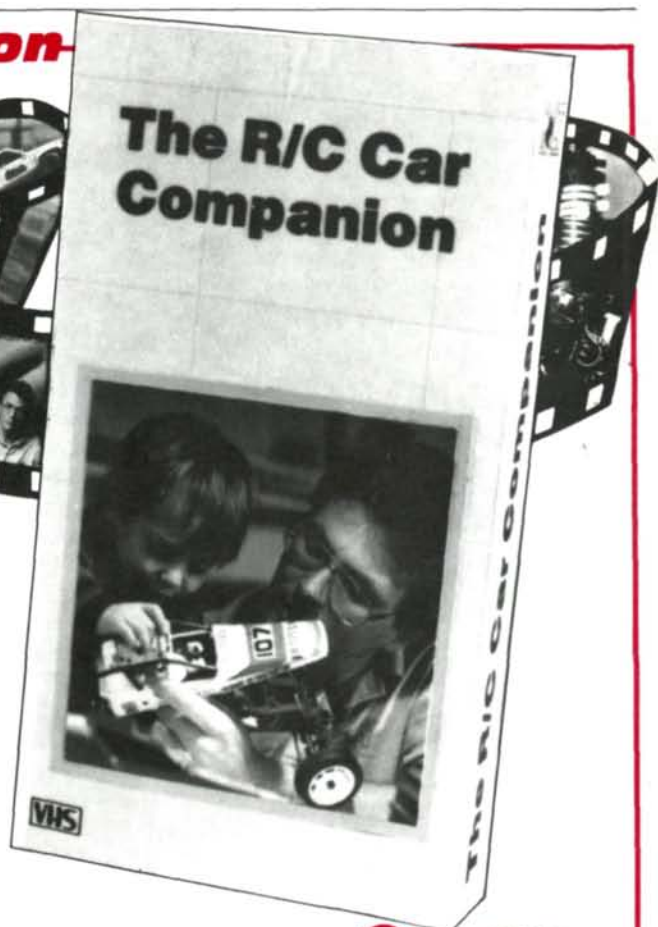
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ALLEC & LANE ULTIMA CONVERSION

To improve the handling on your Ultima, Allec & Lane has introduced a new conversion to adapt its aluminum trailing arms to Kyosho's hottest 2WD car. The kit includes a graphite chassis (for use with the stock Ultima front suspension) that has a 20-degree caster angle in front, and a set of A&L Trailing Arms that bolt directly to the chassis with no modifications or adapters. This conversion allows you to adjust the rear toe-in from 1 to 5 degrees in 1-degree increments to suit your driving ability or track conditions. Put control into your Ultima by putting the power to the ground with A&L's completely engineered rear suspension. The chassis is sold separately or in complete form.

For more information, contact Allec & Lane, P.O. Box 15644, Santa Ana, CA 92705.



HOT TRICK RC10 OVAL CHASSIS

In this chassis, Hot Trick has moved all 6 to 7 cells to the left side of the car, and lowered the center of gravity by cutting slots in the pan. Also included are two posts and a bar to keep the battery pack in place.

For more information, contact Hot Trick Racing, 1157 Cushman Avenue, San Diego, CA 92110.

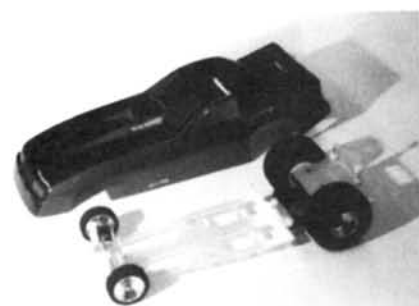
(Continued on page 138)



KYOSHO AXIS EX

Kyosho is proud to introduce the new 1/12-scale, 2WD Axis EX, a sophisticated and versatile on-road racer sporting several entirely original advances in R/C car design. Among the 13.8-inch-long Axis EX's new features are a highly advanced ceramic pressure plate and thrust differential gear that provide incredibly smooth operation and reduce maintenance. The durable carbon-fiber flat chassis comes already cut out to accommodate a saddle-pack battery for an extremely low center of gravity. The design gives the Axis EX outstanding stability and incredibly quick acceleration out of the corners.

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For more information, contact Outlaw Motor Sports, 7920 Webster, Highland, CA 92346.

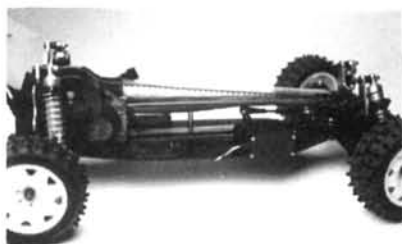


TAMIYA THUNDERSHOT Q.D.

Tamiya's new 1/4-scale Thundershot Q.D. is a car that will charm people of all ages. The body is made of lightweight, impact-resistant plastic resin, and bright decals adorn its exterior. The box chassis is made of engineering plastic for long life, and a sealed gear-box keeps out dirt and comes with a turbo switch for high-speed gearing. Spike tires on all four wheels provide excellent traction for a car this size. Coil springs keep the car level, working through independent suspension in the front and a rolling rigid axle in the rear. The car is powered by eight AA pen-cells and a 9V battery for the transmitter. Tamiya has also chosen a pistol-grip transmitter so that first-time R/C car users will learn how to control a car correctly.

For more information, contact MRC/Tamiya, 2500 Woodbridge Avenue, Edison, NJ 06817.

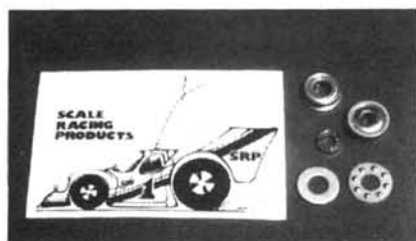
WHAT'S NEW



BULLET RACING OPTIMA MID CHASSIS

The Optima Mid chassis from Bullet Racing is constructed with superlight graphite. This chassis not only reduces the Mid's overall weight, but also lengthens the wheelbase by a full inch. The result is increased stability, both in the air and on the ground. The kit includes upper and lower graphite chassis plates, upper and lower belt covers and a longer belt.

For more information, contact Bullet Racing, 14435 Tomball Parkway, Houston, TX 77086.



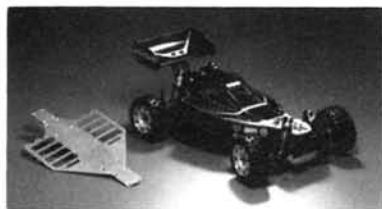
SRP RC10 TRANS CONVERSION

This kit reduces friction in your stock RC10 transmission by aligning the idler gears with the cross-shafts and by replacing the nylon bearing carriers on both sides of the transmission with larger bearings. The kit comes complete with bearings, thrust bearing and washer, and has easy-to-follow instructions.

For more information, contact Scale Racing Products, 6900 Chadbourne Drive, N. Olmstead, OH 44070.

SASSY CHASSIS MID OPTIMA ALUMINUM CHASSIS

This chassis plate is a very light ($\frac{1}{2}$ ounce less than stock) 2024-T3 aircraft-quality aluminum with memory. You



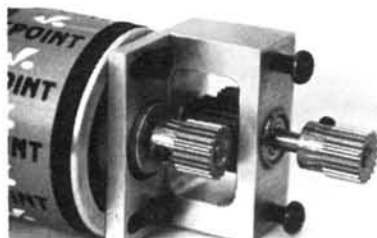
can run saddle packs that help lower the center of gravity and enhance the handling of your car—and it's less than half the price of graphite, to help make winning affordable.



RC10 ALUMINUM CHASSIS

This chassis is made of 6061 T-6 aluminum with memory. It's $1\frac{1}{2}$ ounces lighter than stock and will handle stock suspension or trailing arms. There are several holes for the batteries to enable you to adjust the weight distribution. It will also accommodate the MIP 4WD conversion kit.

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Stormer Racing proudly introduces the first 2-to-1 gear-reduction transmission designed for $\frac{1}{10}$ -scale on-road cars. The aircraft-aluminum transmission bolts directly to the motor-mount plate and allows the user the option of gear ratios up to 16-1. This allows faster acceleration, longer run times, and a cooler-running motor and speed controls. Fits Predator, Round Tracker, Viper, GP10, Shadow 2+2 and many other on-road cars. This transmission can also be

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For more information, contact Stormer Racing, 31 Garden Terrace, Glasgow, MT 59230.



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This diff features a graphite diff axle with a solid, one-piece aluminum end. The kit contains all the necessary components for the diff assembly, except for the spur gear, although a ball bearing is supplied to fit within the spur gear of your choice. Aluminum wheel hubs are included, and the diff side hub is supported with two ball bearings. The hubs fit the TRC BBS wheels, as well as most others using the same hole-and-bolt pattern. The Pro Diff will fit most $\frac{1}{10}$ -scale on-road cars.

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For more information, contact TecnaCRAFT, 1335B Dayton Street, Salinas, CA 93901.

(Continued on page 152)

SHOOTOUT

(Continued from page 135)

line every time with a margin of only half a second. Reed was able to hold off the charging Allec for the win, while Rick Velhow came from the tenth qualifying position to finish third behind Allec.

Although Schumacher Cats dominated the front row (drivers Dieter, Jones and Reed) at the start of the 4WD Stock A-Main, Ron Rosetti, driving a Turbo Optima Mid SE, made his way from the fifth spot to the front, so displacing the Cat for a 1st-place finish. Finishing 2nd was Mike Giem with a Schumacher Cat, and 3rd went to Greg Brown, also racing a Cat.

Unfortunately I'm not able to mention all the drivers who attended. Those who didn't make the A-Mains can still be proud of themselves; racing within an arm's reach of the top sponsored drivers is quite something! Congratulations! ■

MRP STAGE II

(Continued from page 60)

To strengthen the rear shock, the gearbox and the shock-tower trio, MRP

(Continued on page 156)

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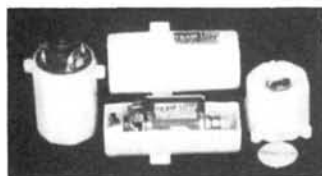
What's New



JR ALPINA PCM

A pistol-grip radio for demanding car racers, this 2-channel PCM system includes such features as runaway-prevention equipment, AM/PCM transmitting system, ABC&W receiver, interchangeable frequency crystals and servo-reversing. This system is also equipped with a computer fail-safe system, BEC, throttle and steering trim and dual-rate steering.

For more information, contact JR Radios/Hobby Dynamics, P.O. Box 3726, Champaign, IL 61821.



RANCH PIT SHOP MOTOR SAFE

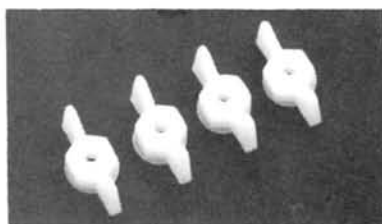
The Team Losi Motor Safe is a unique new motor storage case that holds the motor at just the right height when the lid is off to allow soldering and other motor maintenance. Separate compartment for brushes, springs, etc.

For more information, contact Ranch Pit Shop, 1655 East Mission Boulevard, Pomona, CA 91766.



TRINITY MATCHED 1700 CELLS

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WHEEL NUTS

These nylon locking wing nuts for the rear of your RC10 can also be used as 1/12-scale differential nuts.

For more information, contact Trinity, 1901 E. Linden Avenue, Linden, NJ 07036.

ARISTO-CRAFT MULTI-CHARGAMATIC

The Multi-Chargamatic offers unlimited charging capacity for any size pack and peak-detection charging for transmitter and power packs. It quick-

charges any pack to capacity in 15 minutes or less, and comes with a battery-capacity tester that measures the efficiency of your Ni-Cd packs.



For more information, contact Aristo-Craft/Polk's, 346 Bergen Avenue, Jersey City, NJ 07304.



MCALLISTER CHEVY SPORTSIDE

The ultimate monster truck! This hot new Chevy Sportside pickup body for 1/10-scale chassis is complete with molded-in double roll bars.

For more information, contact McAllister Racing, 2205 First Street, #107, Simi Valley, CA 93065.



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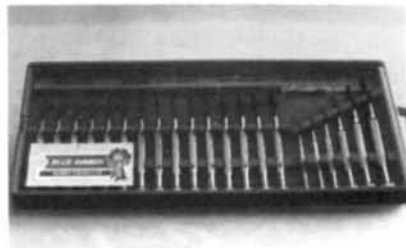
Motion Graphics has introduced a full line of concours-quality, custom-painted R/C car bodies. Lexan/polycarbonate bodies, in 1/10- and 1/12-scale, are featured, and other body types are also available. These unique, custom, graphic designs are highlighted by air-brushed custom colors, including

(Continued on page 155)

WHAT'S NEW

metallics and candy colors. Motion Graphics will also paint a scale replica of your favorite full-scale car. Each custom-painted body features unique detailing.

For more information, contact Motion Graphics, P.O. Box 1590, Westminster, MD 21157.



BLUE RIBBON METRIC TOOL SET

Blue Ribbon has introduced a 21-piece Deluxe Metric Tool Set that does it all when you build an R/C car. It's perfect for assembling almost any kit that's equipped with metric fasteners. The tool set includes five wrenches, two cross-point screwdrivers, three hex-key wrenches, five nut drivers and five standard-point screwdrivers, all in the popular metric sizes. All tools come with free-wheeling heads to aid operation, and the hex-key wrenches and nut drivers come with torque handles for extra leverage.

For more information, contact Blue Ribbon, P.O. Box 7253, Fairfax Station, VA 22039.



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Sibex, Inc. manufactures a Lap Display Unit that's designed to display the total laps of each R/C car when racing. The lap display features 2 1/2-inch-high LED digits for up to 10 lanes. The system includes hand-held switches for manual lap counting by 10 observers. The system is designed to enhance spectator participation and interest at any R/C

race, by providing an easy-to-read, instantaneous display of the race status. This battery-powered system is housed in a 48-inch cabinet and includes all necessary cables.

For more information, contact Sibex, Inc., 1088 Kapp Drive, Clearwater, FL 33575.



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For more information, contact Team Hammer, 12922 Harbor Boulevard, Suite 254, Garden Grove, CA 92640.



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The Kyosho Optima Mid/Turbo Lite-sink is a simple and direct replacement for the stock motor mount. Over 15 square inches of heat-exchange surface area substantially lowers motor operating temperatures. Litesinks are machined to exacting tolerances from aluminum alloy and anodized for an extremely durable finish.

For more information, contact Litespeed, P.O. Box 4765, Spokane, WA 99202.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by Radio Control Car Action, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in Radio Control Car Action.

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MRP STAGE II

(Continued from page 142)

includes an upper fiberglass brace that connects all three, and it's pre-cut to accommodate the mechanical speed control and servo combo. MRP needs to

include an *uncut* brace for those of us who choose to use an electronic speed control, because the cut version simply doesn't allow sufficient mounting space for proper installation of the electronic speed control. To rectify this problem, I took a piece of Lexan from the excess body trim,

screwed it across the opening in the brace, and then, using Velcro, mounted the electronic speed control onto the Lexan.

The steering servo assembly comes next. The manual shows the steering linkage attached at the third hole from the center, but by changing this to the last position, you'll create a sharper turning capability. Remember, any decrease in turning can be performed at the steering adjustment on your radio.

The fiberglass radio tray installation follows. The Stage II is designed to accommodate the battery pack both longitudinally and across the chassis, depending on where you want the center of gravity (CG). Mounting the battery pack longitudinally will shift the CG towards the rear, thus increasing power to the back tires (a plus, on a course with an abundance of jumps); mounting the battery *across* the chassis moves the CG to the center of the car, so improving performance on a course with a lot of curves. The radio tray is designed for easy battery access in both positions. The radio tray also has pre-cut holes for mounting the steering servo, and the holes are drilled to accommodate virtually any size of standard or mini servo. Wheel and tire assembly follow without complications.

(Continued on page 158)

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New P/M 5007 Ford F-150 Truck Body Shown.

Dealer and Distributor inquiries invited.

MRP STAGE II

(Continued from page 156)

The Stage II includes an aerodynamic, off-road, clear Lexan body that has to be

painted. I chose to use authentic Porsche India Red paint from a local automotive paint supply shop. A compatible flex agent is a must when applying automotive paints to a Lexan body. For added

flair, I chose to re-anodize the stock chassis and shocks and to dye all the nylon components a hot red. (See my article "To Dye or Not to Dye," elsewhere in this issue.) To maintain the monochromatic scheme on my Stage II, I chose a Dymond* Red No. 2 racing motor, as well as a red-hot Dialed Racing Products* Performer (a versatile, new, 306-amp electronic speed controller) and a red 7-cell Sanyo* N-1200 SCR racing battery pack.

PERFORMANCE: Prior to running my Stage II, I rechecked all the adjustments on my Kyosho* Pulsar EXP-2001 radio. The EXP-2001 is a 2-channel, pistol-grip, trigger-activated, digital proportional radio system that has reversible wheel assembly (for left-handed racers), steering and throttle end-point adjustment, variable dual-rate steering and exponential rate-adjustment capabilities, all of which are a must for dialing-in any race car to varying track conditions. After a radio check, it was time to rip up the dirt!

Without further delay, I jammed the Pulsar's trigger full throttle, and the Stage II shot up two dirt rooster-tails from both rear, spiked tires as the car sped away. The hot Dymond motor cranks some high rpm and, coupled with the Stage II's

(Continued on page 162)

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MRP STAGE II

(Continued from page 158)

advanced gear setup, it's very competitive. After I got over the initial shock of the Stage II's lightning acceleration, I

wheeled the car into a series of hairpin turns to test its agility. The Stage II gracefully took each turn without any evidence of power loss, or over-steering or severe under-steering. The car seemed to take on each endeavor without hesitation.

OK, so what about the car's jumping ability? Here again, the Stage II is a strong contender. With the battery pack located longitudinally, the power and CG are shifted toward the rear, and the car easily climbs any knoll. Because the Stage II is so well-balanced, it leaps from each jump with its nose up and lands like an F-14 fighter jet—rear tires first, with just a small puff of dust. I was having so much fun driving my Stage II that I just kept plugging in fresh battery packs until my trigger finger tired.

The Stage II gets my highest rating. My only suggestion is that MRP should include a solid, rear-shock system brace to accommodate electronic speed controllers. If you're looking for a really competitive, out-of-the-box racing machine, the Stage II is the right choice.

*Here are the addresses of the manufacturers mentioned in this article:

(Continued on page 164)



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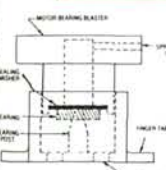
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MRP STAGE II

(Continued from page 162)

MRP, 18676 142nd Ave. NE, Woodinville, WA 98072.

Dymond; distributed by United Model Products, 301 Holbrook Dr., Wheeling, IL 60090.

Dialed Racing Products, 475 W. Hamilton, Suite 225, Campbell, CA 95008.

Sanyo Electric, 200 Riser Road, Little Ferry, NJ 07643.

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820. ■

SCOPING OUT

(Continued from page 86)

controller.

$$V = I \times R$$

$$V = 100 \text{ A} \times .0014 \text{ ohms}$$

$$V = .14 \text{ volts}$$

Using the same equation again, we can find the voltage drop across the motor wires of the controller.

(Continued on page 174)

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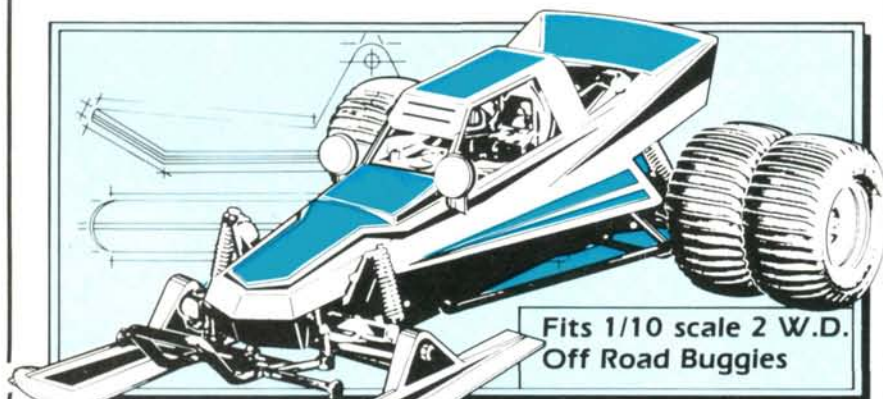
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SCOPING OUT

(Continued from page 164)

$$V = I \times R$$

$$V = 100 \text{ A} \times .0014 \text{ ohms}$$

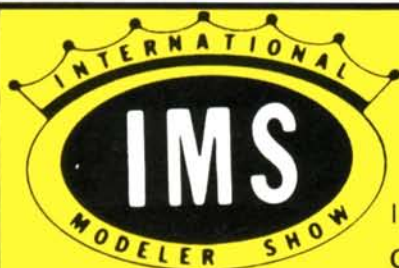
$$V = .14 \text{ volts}$$

From this, we find that there's a sizeable voltage drop in the connecting wires. The manufacturers state only the voltage drop of the speed controller, not the speed controller *and* the wires.

I'm trying to prove that the current ratings in the speed controller specs are wildly exaggerated, and they should be downgraded to a believable level. Even if they used proper construction techniques to handle a current of 100 amps, the Ni-Cd batteries that are approved for sanctioned racing can't *supply* 100 amps. As for the voltage-drop rating, the manufacturers should do the measurement—including the battery and motor-wire drops.

I'm not trying to be negative about the voltage drop and current ratings, but just analytical. However, all the data indicate that speed controllers

(Continued on page 178)



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SCOPING OUT

(Continued from page 174)

can handle a maximum continuous current of 50 amps. If there's a

modeler or a manufacturer who knows of a motor (standard or modified) that draws more than 30 amps, I'd like to hear from him or her. I'd also welcome comments from manu-

facturers about this article.

*"Reference Data for Engineers," edited by Edward C. Jordan, published by Howard W. Sams & Co., 4300 West 62nd St., Indianapolis, IN. ■

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COBRA

(Continued from page 111)

dual-rate steering, reversing and panic switch. This radio gear was augmented with a multi-band resistor speed controller from BoLINK*. Once again, this is the one used in many of the cars we've reviewed in the past. This was attached to the KO Propo PS-301BH servos inside the boat. These ball-bearing, high-speed servos are waterproof. For protection from water, the receiver was enclosed by a rubber balloon. (Do this as a minimum!)

The powerplant in the Cobra was also a part of the Speed 500 Outdrive unit—a Graupner 540 motor. This is the type of 540 motor found in our car kits, so no surprise here. Actually, this will be quite a surprise in just a moment when we hit the water, so hang tight.

When the radio has been installed, the forward hull former is put into place, and

(Continued on page 180)

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COBRA

(Continued from page 178)

this will be the holding area for the batteries. It will also stiffen the forward hull, and will allow the fitting of a saddle pack of six to seven cells for power. To prevent the batteries from sliding toward one another, touching and shorting out, I had to install a piece of plywood right down the center of the hull through the former. The batteries can still slide, but the plywood keeps them from touching. (A single rubber band will hold them in place.)

Now that the tough stuff has been done, the upper hull is cut to shape and then fitted to the lower hull. It almost seems as though you'll be sealing in the radio and batteries permanently, but take heart; there's room to slide them out when you want to. When the upper hull has been fitted, the joint must be completely sealed to prevent leaking. I used silicone sealant in the joint, because it's quick and easy to use.

When the hull is complete, the top cover, wing and wing struts are assembled and fitted to the boat. Graupner has always made high-quality kits with parts that fit well, and this kit is no exception, as the deck parts fit like the proverbial glove. As a final touch, I decorated the Cobra with the kit-supplied decals. The finished boat looks like a million bucks, and not a drop of paint on it!

PERFORMANCE: I readied the Cobra for "go" time with a fully charged battery pack. It felt heavy—not just heavy, but heavy in the *wrong* places, like the front! Oh well, that's what the plans called for. Let's hit the lake.

After putting the Cobra on the water, I let it sit for about five minutes and checked for leaks. No sweat; just plug in the battery and see what it's got! Hit the throttle and BOOM!—the Cobra almost explodes out of the water with the surface-drive prop creating a water "jet" that was totally unexpected. I've run 05-powered boats before, but never with power and speed like this. And although the actual speed was about 18mph, this is really moving when you're driving a boat of this size on water.



For more info on exciting fast electric boats, take a look at our sister publication, Radio Control Boat Modeler. It's filled with reviews and how-to articles.

The Cobra handles very well, slicing through the chop with its deep-vee and often airborne. This is serious race-boat action with spray and rooster-tails instead of flying dirt. I got the Cobra to launch several times—almost on its side and looking as though it was heading for a

flip. But it came right-side up every time with the help of the wing. Wow—this is *it*! Coming ashore, the Cobra was wet all over, but pretty dry inside. What a rocket!

No doubt about it. The Graupner Cobra delivers excitement on the water when you want a break from the race-track. A fast electric like this is a no-sweat affair when you already have everything it takes to get it going. Just think about what kind of performance you can get from this boat with a hot modified motor! Ballistic plus! And, like a modern oven, it's self-cleaning! C'mon, landlubbers; hop on a fast electric boat—hop on the Cobra.

**Here are the addresses of the manufacturers mentioned in this article:*

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Hobby Shack, 18480 Bandilier Circle, Fountain Valley, CA 92728.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

TRACK DIRECTORY

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to **R/C Car Action Track Directory**, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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(Continued on page 182)



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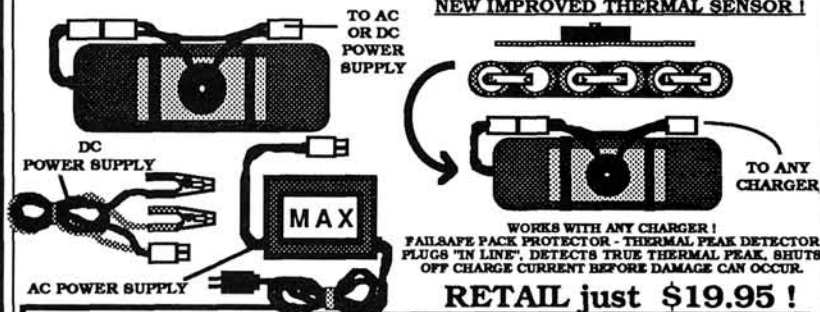
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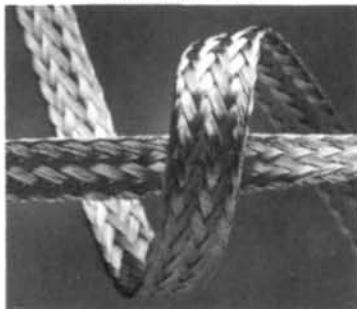
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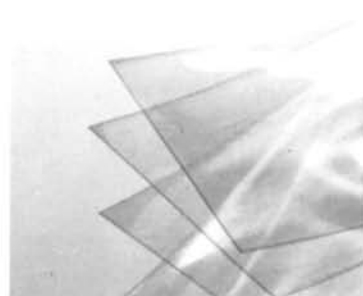
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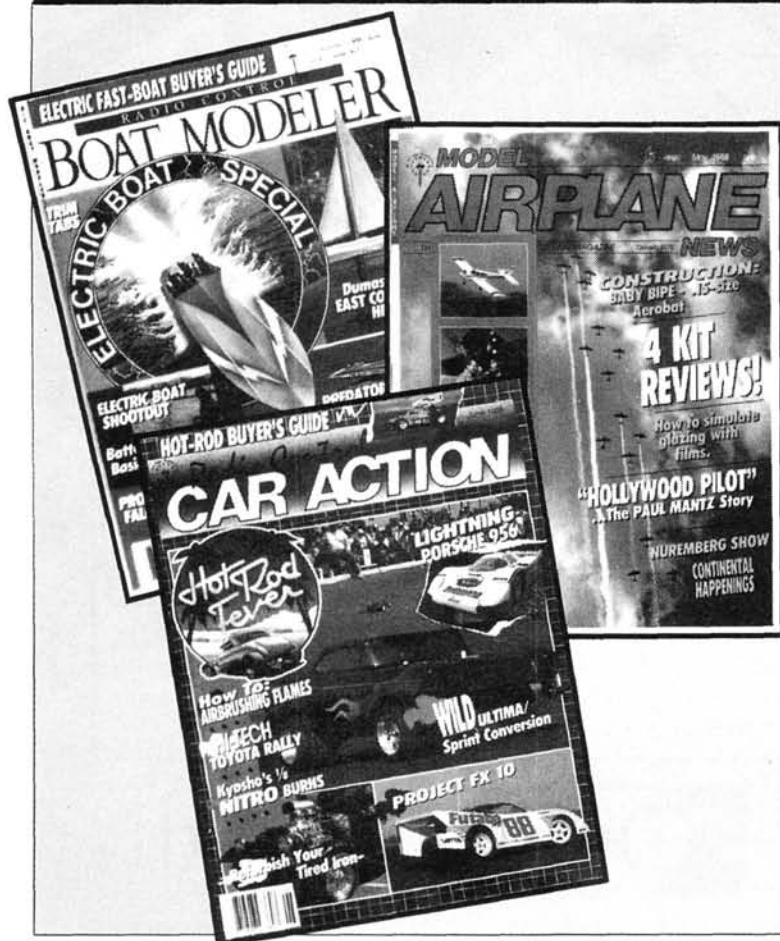
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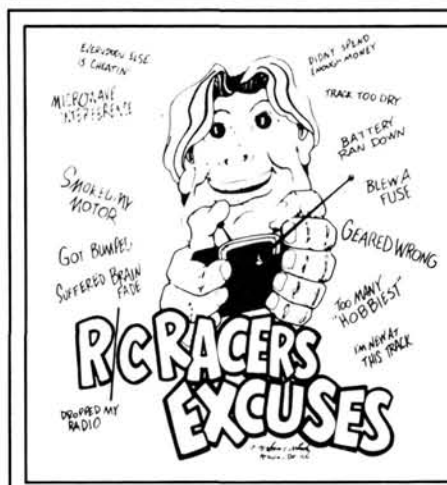
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